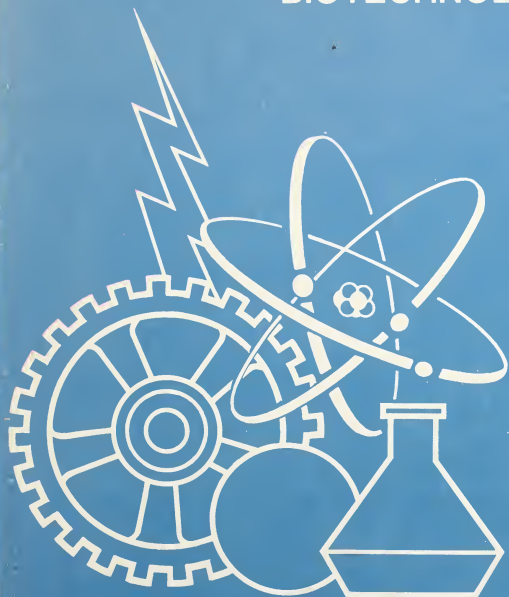


PATENT PROFILES

BIOTECHNOLOGY : 1982 UPDATE





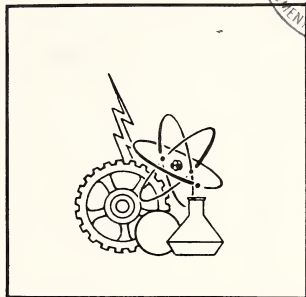
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PATENT PROFILES

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OFFICE OF TECHNOLOGY
ASSESSMENT AND FORECAST



U.S. DEPARTMENT OF COMMERCE

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Patent and Trademark Office

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INTRODUCTION

Background

The patent system has long been recognized as an incentive for innovation in the U.S. free-enterprise system. Often overlooked, however, is a second great benefit of the patent system: the enormous, continually expanding patent file. This file includes more than four million distinct U.S. patents. These patents are classified and cross-referenced among the approximately 113,000 categories of technology that make up the U.S. Patent Classification System. Along with similarly categorized foreign patents and other technical publications, they make up a collection totaling over 25 million documents -- a collection which grows by over half a million documents annually.

Patent law requirements for a full disclosure of the invention (which is then published as part of a patent grant) have resulted in a unique assemblage of technological information. The patent file embodies the most comprehensive collection of technical information of its kind in the world. This information is presented in a manner such that nearly every significant development in almost all technical fields flows in a natural time-series sequence. It virtually welcomes monitoring and analysis.

In its own unique way, this file represents a national resource. The Patent and Trademark Office (PTO) recognizes the heavy responsibilities not only to preserve, maintain, and improve the file, but, as well, to maximize its use for the greatest public benefit. As part of the effort to discharge this latter responsibility, the PTO established its technology assessment and forecast program in 1971.

In its most general terms, the mission of the program is to stimulate and enhance the use and usability of the patent file and to assemble, analyze and make available meaningful data about the file. In carrying out this mission, the Office of Technology Assessment and Forecast (OTAF), which administers the program, has assembled and built a master data base covering all U.S. patents. This data base has been used to support the preparation of OTAF publications (see Appendix B) and OTAF's custom report services (see Appendix C).

PATENT PROFILES

In an effort to continually provide data in a form which is useful and convenient for the interested reader, OTAF initiated a new publication series in December 1979 -- PATENT PROFILES. Each publication deals with a specific technological area, and for a given period of time surveys the patent activity of that area.

PATENT PROFILES provides many different kinds of information about a particular area of the patent file and assembles this information in a format which enables the user to easily extract the information needed.

Thus, interested users, both technically and non-technically oriented, from the public and private sectors will be able to gain insight into the who, what and where of the patent activity in a technology and, perhaps, be able to discern the direction in which the technology is headed.

The objective of these publications is to increase the awareness and use of the U.S. patent file as a prime technological information resource so that the file may contribute more fully to the knowledge from which future inventors and innovators draw and upon which corporate and public policy planners rely.

About This Publication

PATENT PROFILES - Biotechnology was published in July 1982. It included statistics for patent activity from January 1963 through December 1981, and the front pages of patents published from January 1 - June 1, 1982. In response to requests for updated statistics and additional copies of the publication, OTAF presents this revised edition. PATENT PROFILES - Biotechnology: 1982 Update contains all of the information that was in the first edition.* It also has a new section -- "1982 UPDATE" -- with data about the origin and ownership of patents granted during 1982 and statistical summaries of the patent activity from 1963-1982.

"Biotechnology" refers to the wide variety of industrial processes which involve biological systems. It includes the agricultural and fermentation industries, which for centuries have used microorganisms in the production of foods and alcoholic beverages. The pharmaceutical industry, which for many years used microorganisms to produce desired products, has recently begun to benefit from major technical advances in genetic manipulation. Mining, agriculture, oil recovery and pollution control are but a few of the industries which will be influenced as the use of custom-designed microorganisms increases.

This publication does not attempt to include all aspects of the technology. Instead, it focuses on six particular areas of the U.S. patent file which relate to enzymes and microorganisms, their use in the synthesis of certain products, and their preparation or modification.

Mutation/Genetic Engineering, an emerging technology in its own right, is an area within Biotechnology which will ultimately impact on many industries by allowing man to carry out processes which were previously impossible or impractical. The lure of increased profits due to decreasing costs, fewer pollutants, and decreased energy use contributes to its popularity. **Genetic Engineering** refers to laboratory processes which are

*Please note that the Explanation of Data and Format was not revised to include 1982 data.

used to alter the hereditary apparatus of a living cell. The altered cells are then used in industrial processes to produce more or different chemicals or to perform completely new functions.*

An increase in the U.S. patent activity in the area of **Mutation/Genetic Engineering** may be attributed to changes in PTO policy in view of the Supreme Court decision of Diamond v. Chakrabarty in 1980.** Prior to the decision, the PTO had not allowed patent claims drawn to live microorganisms. Many applications containing such claims were held in suspension pending the decision. This practice, which resulted in a delay in the issuance of U.S. patents, may have also fostered a reluctance to file patent applications in the United States. Therefore, as a complement to the profile of U.S. patent activity, the **Mutation/Genetic Engineering** section also includes a listing of selected foreign patent documents which were published between August 1980 and March 1982. The listing includes the publication date, assignee or inventor, and a brief description of the subject matter.

Enzymes have been described as the basic tools of Biotechnology. They function as regenerative catalysts which permit the use of milder reaction conditions to produce desired products in an environmentally safe manner. **Immobilized Enzymes**, i.e., those bound to a carrier, offer additional economic advantages. They are more stable when exposed to changes in reaction conditions, and binding the enzymes often makes them insoluble. These factors ensure that reclamation of these expensive materials is more easily accomplished.

Tissue Culture refers to processes and apparatus which permit the growth and maintenance of cell lines. The techniques are of extreme importance in medical fields where they are used to produce vaccines, steroids, antibodies, and skin and organ transplant materials.

The expression "**Starch Hydrolysates**" is used in this publication to refer to processes using enzymes or microorganisms to produce monosaccharides. An example of such a process is the hydrolysis of starch to sugar. The profitable production of high fructose corn syrup using immobilized enzymes, instead of acid hydrolysis, is another example which illustrates the commercial benefits of such processes.

Amino Acids, the building blocks of protein, are also useful as food supplements. They may be produced from low cost carbohydrate and hydrocarbon feedstocks by the use of microorganisms and enzymes. These biological processes have advantages over chemical processes in that desirable or active forms of the compounds are produced.

*Office of Technology Assessment, U.S. Congress, Impacts of Applied Genetics: Micro-Organisms, Plants, and Animals, (Washington, DC.: Government Printing Office, 1981). p. ix.

**See the discussion of legal decisions affecting Biotechnology patenting, page 9.

TABLE I		Summary of the results of the experiments	
Experiment	Results	Experiment	Results
1	...	10	...
2	...	11	...
3	...	12	...
4	...	13	...
5	...	14	...
6	...	15	...
7	...	16	...
8	...	17	...
9	...	18	...
19	...	19	...
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96	...	96	...
97	...	97	...
98	...	98	...
99	...	99	...
100	...	100	...

EXPLANATION OF DATA AND FORMAT

This report presents profiles of patenting* in 6 areas of Biotechnology. Each of the profiles is divided into six parts (1, 2A, 2B, 2C, 2D, 3):

Part 1 - Activity Summary

Part 1, the first page of each profile, identifies the area which is examined, lists the pertinent U.S. Patent Classification(s) involved, and graphically illustrates patent activity (across a designated 10-year span) in two ways: (1) by the patent grant date; (2) by the granted patents' application filing date. The latter method presents what is often considered a more useful measurement tool since application filing dates are closer in time to the actual development of the technology disclosed in the patent and are independent of PTO production variance.** The relative growth in the particular technological area, as well as levels of involvement by foreign residents, corporations, and government agencies, expressed as a percentage of recent U.S. patent activity, are presented in the "Activity Indices" (defined below).

EXAMPLE

IMMOBILIZED ENZYMES

This profile includes immobilized or carrier-bound enzymes or microbial cells and processes for preparing them. Immobilization results when the enzyme or microbial cell is covalently or ionically bonded to a carrier or entrapped within a carrier. The carrier material physically confines the enzyme or microbial cell during a continuous process or enhances recoverability in a batch process. Examples of immobilized enzymes are enzymes chemically or physically bonded to a water-insoluble matrix, enzymes contained within a polymer or gel, and enzymes adsorbed on a solid.

INCLUDED IN THIS PROFILE ARE ALL OF THE PATENTS FROM:

Class 435, Subclasses 174-182

ACTIVITY INDICES (1979-1981)

GROWTH	33.2%
FOREIGN SHARE	54.2%
CORPORATE OWNED	91.0%
GOVERNMENT OWNED	5.3%
U.S. OWNED OF FOREIGN	11.9%

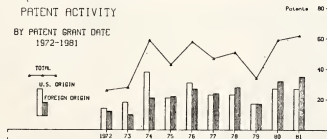
U.S. PATENT CLASSIFICATION

SCOPE OF TECHNOLOGY

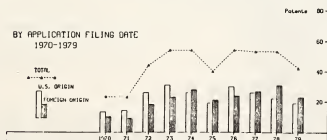
ACTIVITY INDICES - DEFINED

PATENT ACTIVITY

BY PATENT GRANT DATE
1972-1981



BY APPLICATION FILING DATE
1970-1979



% GROWTH: the number of patents issued in the period 1979-1981 divided by the total number of patents in the period 1972-1981. (Average for all technologies = 26.1%)

% FOREIGN: the number of patents issued to residents of foreign countries in the period 1979-1981 divided by total number of patents issued in this period. (Average for all technologies = 39.6%)

% CORPORATE OWNED: the number of 1979-1981 patents assigned at time of issue to U.S. or foreign non-government organizations -- mainly corporations -- divided by the total number of patents issued in this period. (Average for all technologies = 75.7%)

% GOVERNMENT OWNED: the number of 1979-1981 patents assigned at time of issue to the U.S. or a foreign government divided by total number of patents issued in this period. (Average for all technologies = 2.4%)

% U.S. OWNED OF FOREIGN: the number of 1979-1981 patents with a foreign resident inventor that are assigned to a U.S. organization, divided by the number of patents with a foreign resident inventor in these years. (Average for all technologies = 7.3%)

* U.S. Patents only

**See further explanation in Appendix A.

Part 2A - Patent Activity by Date

Part 2A of each profile shows in tabular form the data relied upon in constructing the charts in Part 1. The first table shows the yearly distribution of patents by the date of the patent grant, while the second table redistributes these data based on the application filing date of the patents. The usefulness of this latter data distribution is mentioned in the explanation of Part 1, and further detailed in Appendix A.

IMMOBILIZED ENZYMES - PART 2A

EXAMPLE

PATENT ACTIVITY (1/63-12/81) BY DATE OF PATENT GRANT

	63-67	1968	1969	1970	1971	1972	1973	1974	1975	1976
TOTAL	12	1	2	6	14	26	28	59	43	58
U.S. ORIGIN	6	1	2	6	9	14	18	38	21	31
FOREIGN ORIGIN	6				5	12	10	21	22	27
JAPAN	2					1	2	3	7	11
WEST GERMANY	1				1		3	3	2	4
UNITED KINGDOM					3	4	2	7	8	1
FRANCE								2		2
SWEDEN						1	1	1		
SWITZERLAND								1		1
ISRAEL	2				1	3			1	1
DENMARK									1	1
NETHERLANDS							1	1	1	1
CZECHOSLOVAKIA	1									
ITALY							1			
AUSTRALIA										1
CANADA										
BELGIUM									1	
HUNGARY										1
AUSTRIA										
U.S. ORIGIN	6	1	2	6	9	14	18	38	21	31
U.S. CORP. OWNED	4	1	1	4	9	12	14	34	19	29
U.S. GOVT. OWNED										
U.S. INDIV. OWNED	2			1	1	1	1	3	1	1
FOREIGN OWNED			1				1			
FOREIGN ORIGIN	6				5	12	10	21	22	27
U.S. OWNED	6				1	4	1	1	1	2
FOREIGN OWNED					4	8	10	21	21	25
FOREIGN CORP.	3				4	8	8	20	19	19
FOREIGN GOVT.										2
FOREIGN INDIV.	3						2	1	2	4

Part 2B - Organizational Patenting - Ranked

Part 2B of each profile provides a list of assignees* ranked by the number of patents, in the technology, to which they held title at the time of the patent grant. The listing is limited by designation of a "cut-off" number (e.g., "2 or more patents"). This list identifies the assignees (mostly corporations), which received the most patents in the profiled technology during 1969-1981.

EXAMPLE

STARCH HYDROLYSATES

NO. OF PATENTS	ASSIGNEES WITH 2 OR MORE PATENTS (1969-1981)
47	CPC INTERNATIONAL INC.
23	HAYASHIBARA CO.
21	STANDARD BRANDS INC.
18	A. E. STALEY MANUFACTURING CO.
8	N. J. RETNOLDS TOBACCO CO.
7	AGENCE NATIONALE DE VALORISATION DE LA RECHERCHE (ANVAR)
7	ANHEUSER-BUSCH, INC.
7	NOVO INDUSTRI A/S
6	MILES LABORATORIES INC.
4	KYOWA HAKKO KOGYO CO., LTD.
4	CORNING GLASS WORKS
4	HAYASHIBARA BIOCHEMICAL LABS. INC.
4	MONSANTO CO.
4	PENICK & FORD LTD.
3	GLAXO LABORATORIES LTD.
3	TANABE SEITAKU CO. LTD.
3	TAKEDA CHEMICAL INDUSTRIES LTD.
3	CHEVRON RESEARCH CO.
3	BAXTER TRAVENOL LABS., INC.
3	IMPERIAL CHEMICAL INDUSTRIES LTD.
3	HAYASHIBARA SEIBUTSU KAGAKU KENYUJO K.K.
3	NATIONAL DISTILLERS AND CHEMICAL CORP.
3	GRAIN PROCESSING CORPORATION
3	MEIJI SEIKA KAISHA LTD.
3	PURDUE RESEARCH FOUNDATION
3	GREAT WESTERN SUGAR CO.
2	DENKI KAGAKU KOGYO K.K.
2	BAYER AKTIENGESellschaft
2	BATTIELE MEMORIAL INSTITUTE
2	RESEARCH CORPORATION
2	RIKAGAKU KENYUJO
2	DAIICHI KENYUJO
2	MITSUBISHI CHEMICAL INDUSTRIES LTD.
2	UNITED STATES OF AMERICA (DEPT. OF ENERGY)
2	UNITED STATES OF AMERICA (ARMY)
2	DOW CHEMICAL CO.
2	ICI AMERICA INC.
2	FORM & HAAS CO.
2	ROQUETTE FRERES

*See definition in Appendix A.

Part 2C - Organizational Patenting - Alpha Listing

Part 2C of each profile also covers assigned patenting during the period 1969-1981. Assignees are listed alphabetically followed by a numerical listing of their patents with titles.

This section provides valuable information to potential entrepreneurs, competitors and those in need of technological know-how by identifying corporate actors in the field. Inclusion of patent titles further defines the subject technology.

EXAMPLE

IMMOBILIZED ENZYMES - PART 2C
ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

ABBOTT LABORATORIES
4070246 - REACTIVE MATRICES

AB STADER
3996107 - ENZYMATIC PRODUCTION OF A STARCH CONVERSION PRODUCT HAVING A HIGH

A. E. STALEY MANUFACTURING COMPANY
3956066 - GLUCOSE ISOMERIZING ENZYME

AGENCE NATIONALE DE VALORISATION DE LA RECHERCHE (ANVAR)
3753858 - METHOD OF CONVERTING GLUCOSE INTO FRUCTOSE
3932587 - METHOD FOR PRODUCTION OF IMMOBILIZED ENZYME
3950222 - METHOD OF IMMOBILIZING ENZYMES TO MICROBIAL CELLS
4004979 - PREPARATION OF ACTIVE PROTEINS CROSS-LINKED TO INACTIVE PROTEINS

AGENCY OF INDUSTRIAL SCIENCE & TECHNOLOGY
4160698 - ENZYME IMMOBILIZATION WITH AZIDIO COMPOUNDS
4269941 - METHOD FOR ENZYME IMMOBILIZATION

AJINOMOTO COMPANY INCORPORATED
3958517 - IMMOBILIZATION OF BIOLOGICALLY ACTIVE PROTEINS WITH A POLYPEPTIDE
4291173 - METHOD FOR DETERMINING AMMONIA AND SENSOR THEREOF
4299669 - METHOD FOR DETERMINING THE CONCENTRATION OF AN L-AMINO ACID IN FE

Part 2D - Inventors of Individually Owned Patents

In Part 2D, inventor names, full addresses, patent numbers and titles are given for unassigned 1975-1981 patents; inventor names, city and state, patent numbers and titles are given for patents assigned to individuals. This information facilitates identification of the apparently unaffiliated or "independent inventor" participants in the technology. Standard, two character codes are used to designate U.S. states and foreign countries. While the meaning of state codes should be obvious, the foreign country codes may not. Consequently, those appearing in the Part 2D listing are defined in Appendix A.

EXAMPLE

IMMOBILIZED ENZYMES - PART 2D				INVENTORS OF INDIVIDUALLY OWNED PATENTS (1/75-12/81) (ALPHA LISTING)		PAGE 0	
INVENTOR NAME	MAJID	STREET	CITY	ST	ZIP/CNTRY		
ALLI	256823 - ENZYME IMMUNODASSAY FOR ALLERGIC DISORDERS	19 EDELMONT PL.	TEANECK	NJ	07666		
ALLEN	4115198 - METHOD OF IMMOBILIZATION OF BIOLOGICALLY ACTIVE ORGANIC SUBSTANCES INCLUDING ENZYMES	2034 DUBLIN-GRANVILLE RD.	COLUMBUS	OH	43229		
BARRETT	4001583 - COVALENTLY BOUND BIOLOGICAL SUBSTANCES TO PLASTIC MATERIALS AND USE IN RADIOASSAY	1500 SPRING GARDEN ST.	PHILADELPHIA	PA	19101		
BRENNER	3956113 - PROCESS FOR THE MANUFACTURE OF AMINO COMPOUNDS FIXED TO CARRIERS	SPIEGLERSTRASSE 33	CH-4059 BASEL	CH			
CHARLES	MARVIN	622 N. 29 ST.	ALLEN TOWN	PA	18104		

At the end of Part 2D is a list of those patents (1963-1981) with neither assignment nor inventor information in the data base. Essentially, this encompasses all patenting in the period 1963-1968, and unassigned patents from 1969 through 1974. Titles are included for most patents granted subsequent to January, 1969.

PATENTS (1/63-12/81) WITH NEITHER ASSIGNMENT NOR INVENTOR INFORMATION IN THE DATA BASE

3539455 - MEMBRANE POLAROGRAPHIC ELECTRODE SYSTEM AND METHOD WITH ELECTROCHEMICAL COMPENSATION
3639958 - IMMUNOLOGICAL REAGENT PARTICLES HAVING PROTEINACEOUS MATERIALS COVALENTLY BONDED THERETO
3715277 - PREPARATION OF FIBERS CONTAINING FIBERS
3736230 - PROCESS FOR PRODUCING 6-AMINOINDOLYLACETIC ACID
3802815 - METHOD AND MEANS FOR NATURAL GAS DETECTION
3827965 - METHOD AND DEVICE OF ARTIFICIAL ENDOCRINE PANCREAS
3843443 - POLYPEPTIDE MATERIALS BOUND TO FLUOROCARBON POLYMERS
3850798 - METHOD FOR SEPARATING A POLYPEPTIDE FROM MICROORGANISMS
3410754 3413198 3414479 3415804 3416997 3418211 3419471 3419472 3095307 3126324 3139290 3167485

Part 3 - Front Pages of Selected Patents

Part 3 of each profile includes the front, or summary, page of selected patents. In addition to providing bibliographic information, such as the inventor, assignee, filing date, and patent classification, the front page of each patent includes a brief abstract describing the invention, and, where appropriate, a representative drawings illustrating the invention.

Part 3 of each profile includes the front page of patents issued between January and April, 1982 (for all profiles except Mutation/Genetic Engineering which contains patents through June 1, 1982), as well as other patents of interest in the subject area. Also included is a list of the selected patents in order of appearance.

Foreign Patent Documents

Following Part 3 of the Mutation/Genetic Engineering profile is a listing of recent foreign patent documents in the International Patent Classification entitled "Genetic Engineering." The documents included were published between August, 1980 and March, 1982, and are those for which no corresponding U.S. patent document presently exists. Tables showing document number, origin, date, subject matter and assignee or inventor begin on page 43.

* * *

PATENTS INCLUDED IN THE PROFILES

Patent activity profiles are normally generated by first identifying key Patent and Trademark Office classifications, i.e., those entirely or substantially pertinent to the technology of interest. All the patents in these classifications are then included in the profile. This procedure results, in most cases, with the inclusion of the majority of patents relevant to the technology and few non-relevant patents. While one can never be sure of the absolute completeness or "purity" of any subset in a collection as large and varied as the patent file, it is felt that the patent file portions selected for review in this publication include patents representative of the overall trends in the defined areas and essentially exclude patents which are not relevant to the subject technology.

Important Note

It should also be noted that in 1979, the Patent and Trademark Office issued substantially fewer patents than normal (about 49,000 as compared to about 66,000 in 1978) due to a lack of funds to print patents. Therefore, while the 1979 patent grant data may be low, the decrease should not be attributed to a fall-off in technological activity.

LEGAL DECISIONS AFFECTING BIOTECHNOLOGY PATENTING

Background

Prior to the decision of the Supreme Court in Diamond v. Chakrabarty¹, the policy of the U.S. Patent and Trademark Office (PTO) had been to allow patent protection for processes using microorganisms and for products containing microorganisms in combination with inert carriers or other elements. The PTO had not, however, issued patents which claimed microorganisms, per se. The PTO felt that new life forms were not statutory subject matter as defined by 35 USC 101, and that only legislative action, such as the Plant Patent Act of 1930 and the Plant Variety Protection Act of 1970, would permit enlarging the scope of patent protection. This view was enforced by the decision of the Court of Customs and Patent Appeals (CCPA) in In re Mancy², which held patentable a process for using a novel strain of microorganism. It presumed "without deciding," that claims to the novel microorganism would not be patentable since the microorganism was a product of nature, and therefore not new, as required by patent law.

Chakrabarty

In 1972, Chakrabarty, a microbiologist working for the General Electric Company, filed a patent application, claiming "a bacterium from the genus *Pseudomonas* containing at least two stable energy-generating plasmids, each of said plasmids providing a separate hydrocarbon degradative pathway." This human-made, genetically engineered bacterium was described as capable of breaking down multiple components of crude oil. Because of this property, possessed by no naturally occurring bacteria, Chakrabarty believed his invention to have significant value for the treatment of oil spills.

Chakrabarty's claims were of three types: first, the method of producing the bacteria; second, the bacteria combined with a carrier material; and third, the bacteria themselves. The patent examiner allowed the claims falling into the first two categories, but rejected claims for the bacteria. His decision was based on two grounds: that microorganisms are "products of nature," and, that as living things, they are not patentable subject matter under 35 USC 101.

Chakrabarty appealed the rejection of these claims to the Patent Office Board of Appeals. The Board reversed the Examiner on the first ground, concluding that the new bacteria were not products of nature, because *Pseudomonas* bacteria containing two or more different energy-generating plasmids are not naturally occurring. However, they affirmed on the second ground of rejection. Relying on the legislative history of the

¹Diamond v. Chakrabarty, 100 S.Ct. 2204, 206 USPQ 193 (1980).

²In re Mancy, 499 F. 2d 1289, 182 USPQ 303 (1974).

1930 Plant Patent Act, in which Congress extended patent protection to certain asexually reproduced plants, the Board concluded that Section 101 was not intended to cover living things such as these laboratory created microorganisms.

Chakrabarty then appealed to the CCPA³, where, by a divided vote, the decision was reversed. The CCPA cited its prior decision, In re Bergy,⁴ which held that the fact that microorganisms are alive is without legal significance for purposes of the patent law. Judge Rich, writing for the majority, proclaimed that it is not necessary that Congress shall have foreseen a new field of technology or useful art to bring it within the scope of 35 USC 101.

The Government appealed to the Supreme Court, which held that a live, human-made microorganism is patentable subject matter under 35 USC 101.

The Supreme Court based its decision on the fact that Congress, in choosing such expansive terms in 35 USC 101 as "manufacture" and "composition of matter" modified by the comprehensive "any," contemplated that the patent laws should be given wide scope. The Court cited the Committee Reports accompanying the 1952 Patent Act as evidence that Congress intended statutory subject matter to "include anything under the sun that is made by man." Chief Justice Burger, writing for the majority, stated that "the patentee has produced a new bacterium with markedly different characteristics from any found in nature and one having potential for significant utility. His discovery is not nature's handiwork, but his own; accordingly it is patentable subject matter under section 101."

PTO Practice after Chakrabarty

After the Chakrabarty decision, the PTO issued an announcement that patent applications including claims to microorganisms which had been under suspension would now be examined. Assuming that the products involved were the result of human intervention and were not products of nature, such claims would not be rejected under 35 USC 101 as directed to unpatentable subject matter.

The PTO clarified the issue in the Manual of Patent Examining Procedure (MPEP) Section 2105, where it issued guidelines as to how 35 USC 101 would be interpreted. The MPEP reviewed the Supreme Court statements set forth in the Chakrabarty opinion and concluded that (1) the Court did not limit its decision to genetically engineered living organisms, (2) the Court enunciated a very broad interpretation of "manufacture" and "composition of matter" in Section 101, and (3) the Court set forth several tests for weighing whether patentable subject matter under Section 101 is present. Of the tests set forth by the Court the following are especially noted as applying to biotechnology:

³In re Chakrabarty, 571 F. 2d 40, 197 USPQ 72 (1978).

⁴In re Bergy, 563 F. 2d 1031, 195 USPQ 344 (1977). See also In re Bergy, 596 F. 2d 952, 201 USPQ 352 (1979).

"A nonnaturally occurring manufacture or composition of matter - a product of human ingenuity - having a distinctive name, character and use is patentable subject matter."

"Production of articles for use from raw materials by giving these materials new forms, qualities, properties or combinations whether by hand, labor or machinery is a manufacture under Section 101."

Other PTO Requirements

35 U.S.C. 112 requires the inventor to set forth a written description of the invention in a manner to enable any person, skilled in the art to which it pertains, to make and use it. In patent applications where the claimed invention involves the use of a microorganism, a problem arises when the microorganism is neither known nor readily available to the public. In many cases, microorganisms are obtained from soil samples. Since soil samples are teeming with microbial life, it is impossible to find a match to the inventor's microorganism. A written description cannot sufficiently disclose how to obtain the microorganism from nature so as to satisfy the requirements under 35 U.S.C. 112.

In response to this problem, the CCPA in In re Argoudelis⁵ sanctioned the practice which provides that a culture of the microorganism be deposited in a United States depository before the application is filed. Following the decision, the PTO published guidelines in MPEP 608.01(p) which set forth the requirements necessary to provide an adequate disclosure of the microorganism in accordance with 35 USC 112.

The guidelines require: 1) that the applicant, no later than the U.S. filing date of the application, make a deposit of the culture of the microorganism in a depository affording permanence of the deposit and ready accessibility thereto by the public if a patent is granted; 2) that the deposit be referred to in the body of the specification as filed and be identified by deposit number, name, and address of the depository; and that the taxonomic description, to the extent available, be included in the specification; 3) that the applicant provide assurance, in the form of an averment under oath or a declaration, of the permanent availability of the culture to the public.

* * *

⁵In re Argoudelis, 434 F. 2d 1390, 168 USPQ 99 (1970).

MUTATION/GENETIC ENGINEERING

This profile is directed to processes for producing a stable, inheritable change in the genotype of an animal, a plant cell or a microorganism. This may be accomplished by artificially inducing a structural change in a gene or by the incorporation of genetic material from an outside source. The outside source may include chemically synthesized or modified genes. Also included are methods of modifying plasmids by chemical or biochemical processes.

INCLUDED IN THIS PROFILE ARE ALL OF THE PATENTS FROM:

Class 435, Subclass 172

AND SELECTED PATENTS FROM:

Class 435, Subclasses 5, 6, 8,
89-91, 253, 820

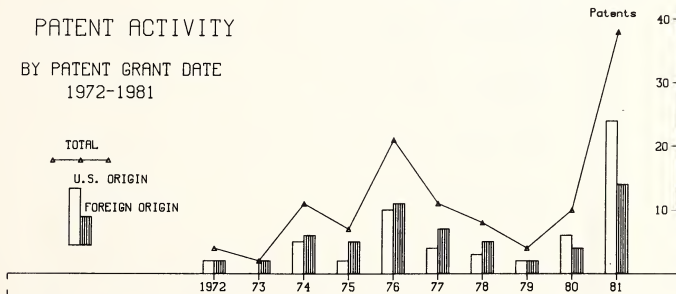
Class 424, Subclasses 85, 117

ACTIVITY INDICES (1979-1981)

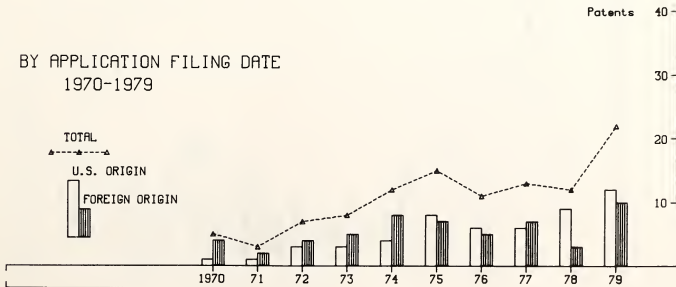
GROWTH	44.8%
FOREIGN SHARE	38.5%
CORPORATE OWNED	80.8%
GOVERNMENT OWNED	5.8%
U.S. OWNED OF FOREIGN	10.0%

PATENT ACTIVITY

BY PATENT GRANT DATE
1972-1981



BY APPLICATION FILING DATE
1970-1979



MUTATION/GENETIC ENGINEERING - PART 2A

PATENT ACTIVITY (1/63-12/81) BY DATE OF PATENT GRANT

NUMBER OF PATENTS														PAGE A	
63-67	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	TOTAL
TOTAL	9	2	4	1	9	4	2	11	7	21	11	8	4	10	38
U.S. ORIGIN	5	4	4	3	3	2	5	2	10	4	3	2	6	24	70
FOREIGN ORIGIN	4	2	1	6	6	2	2	6	5	11	7	5	2	4	14
JAPAN	1	1		4	1			1	2	2	1	3			5
WEST GERMANY	2							1	1	2	2		1		2
FRANCE					1		1	1	1	2	2		1		8
UNITED KINGDOM				1		1					1				1
SWITZERLAND						1		2	1						1
NETHERLANDS	1							1							1
U.S.S.R.										1					1
SWEDEN				1					1						1
BELGIUM								1		1					2
CANADA			1						1						2
AUSTRIA									1			1			2
ITALY										1					1
AUSTRALIA									1						1
HUNGARY															1
INDIA											1				1
DENMARK															1
MEXICO	1														1
U.S. ORIGIN	5	4		3	2			5	2	10	4	3	2	6	24
U.S. CORP. OWNED	3	3		3	2			4	2	9	4	3	2	6	20
U.S. GOVT. OWNED	1									1					2
U.S. INDIV. OWNED	1	1						1							2
FOREIGN OWNED															
FOREIGN ORIGIN	4	2		1	6	2	2	6	5	11	7	5	2	4	14
U.S. CORP. OWNED															
U.S. GOVT. OWNED	4	2		1	6	2	2	5	1	1	7	1	2	4	12
U.S. INDIV. OWNED															
FOREIGN CORP.	4	2		1	6	2		4	4	8	6	4	1	3	8
FOREIGN GOVT.															
FOREIGN INDIV.								1	3	1			1	4	10

MUTATION/GENETIC ENGINEERING

PATENT ACTIVITY (PATENTS GRANTED 1/67-12/81) BY DATE OF PATENT APPLICATION

	NUMBER OF PATENTED APPLICATIONS--														PAGE A	
	PRE 68	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	TOTAL
TOTAL	8	5	5	5	3	7	8	12	15	11	13	12	22	6	6	132
U.S. ORIGIN	2	2	3	1	1	3	3	4	9	6	6	9	12	3	3	65
FOREIGN ORIGIN	4	3	2	4	2	4	5	8	7	5	7	3	10	3	3	67
JAPAN	2	2	2	2	1	1	1	3	2	2	2	2	3	2	2	20
WEST GERMANY																7
FRANCE				1		1	1		3	1	1	1	2			8
UNITED KINGDOM			2					3			1	1	1			7
SWITZERLAND							2									2
NETHERLANDS																3
U.S.S.R.	1			1		1	2		1			1	1	1		5
SWEDEN																3
BELGIUM		1				1		1	1							3
CANADA																2
AUSTRIA	1					1										2
ITALY																2
AUSTRALIA																2
HUNGARY																2
INDIA										1		2				2
DENMARK													1			1
MEXICO										1						1
U.S. ORIGIN	4	2	3	1	1	3	3	4	8	6	6	9	12	3		65
U.S. CORP. OWNED	3	2	3	1	1	2	3	4	7	6	6	8	11	1	1	58
U.S. GOVT. OWNED									1			1				3
U.S. INDIV. OWNED	1					1							1	1		4
FOREIGN OWNED																
FOREIGN ORIGIN	4	3	2	4	2	4	5	8	7	5	7	3	10	3		67
U.S. OWNED																
FOREIGN OWNED	4	3	1	4	2	4	4	8	7	4	7	3	9	2		60
FOREIGN CORP.																
FOREIGN GOVT.	4	3	1	3	4	4	4	6	5	4	6	1	7	1		49
FOREIGN INDIV.											1	2	2	1		10

MUTATION/GENETIC ENGINEERING

Organizational Patenting: Ranked

NO. OF
PATENTS

ASSIGNEES WITH 2 OR MORE PATENTS (1969-1981)

7	UPJOHN CO.
5	MASSACHUSETTS INSTITUTE OF TECHNOLOGY
4	✓ CIBA-GEIGY CORP.
4	GENERAL ELECTRIC CO.
4	✓ UNIVERSITY OF ILLINOIS FOUNDATION
3	AJINOMOTO CO. INC.
3	CETUS CORP.
3	TAKEDA CHEMICAL INDUSTRIES LTD.
3	RIKAGAKU, KENKYUSHO
3*	✓ UNIVERISTY OF CALIFORNIA, THE REGENTS OF
2	AGENCE NATIONALE DE VALORISATION DE LA RECHERCHE (ANVAR)
2	AGROFERM AG
2	CPC INTERNATIONAL INC.
2	GESELLSCHAFT FUR BIOTECHNOLOGISCHE FORSCHUNG MBH
2	INSTITUT FRANCAIS DU PETROLE
2	KERNFORSCHUNGSANLAGE JULICH GMBH
2	KYOWA HAKKO KOGYO CO. LTD.
2	RECHERCHE ET INDUSTRIES THERAPEUTIQUES, R.I.T.
2	STERLING DRUG INC.
2	UNIVERSITY OF MICHIGAN, THE REGENTS OF
2	UNIVERSITY OF MINNESOTA, THE REGENTS OF
2	WISTAR INSTITUTE
2	BEECHAM GROUP LTD.
2	GLAXO LABORATORIES LTD.
2	MERCK & CO., INC.
2	SMITHKLINE CORP.
2*	✓ STANFORD UNIVERSITY, LELAND JUNIOR, THE BOARD OF TRUSTEES

*Composite Total. See Appendix A.

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

ABBOTT LABORATORIES

4224408 - DEOXYRIBONUCLEIC ACID SYNTHESIS USING BINDING PROTEIN

AGENCE NATIONALE DE VALORISATION DE LA RECHERCHE (ANVAR)

3833474 - ASPEROGENIC PROTEASE-PRODUCING STRAINS OF BACILLUS SUBTILIS
4172764 - PROCESS FOR OBTAINING HYBRID STRAINS OF YEASTS

AGROFARM AG

4136291 - MICROBIOLOGICAL METHODS
4211846 - PROCESSES FOR THE MANUFACTURE OF D(-)-3-HYDROXYBUTYRIC ACID AND D(-)-3-HYDROXYBUTYRIC ACID PRODUCING MUTANTS

AJUNOMOTO COMPANY INCORPORATED

3622459 - METHOD OF PREPARING A PROTEOLYTIC ENZYME BY FERMENTATION
4066501 - METHOD FOR PRODUCING L-LYSINE BY FERMENTATION
4275157 - METHOD FOR THE PRODUCTION OF L-LYSINE

AKTIEBOLAGET ASTRA

3616236 - PRODUCTION OF RHIZOBIUM STRAINS RESISTANT TO DRYING

AKZONA INCORPORATED

4232403 - DETECTION AND/OR DETERMINATION OF IGM, IGA, IGD AND IGE IMMUNOGLOBULINS

ALBERT ROLLAND S. A.

3669846 - PROCESS FOR OBTAINING AND PRESERVING STABLE BACTERIAL VARIANTS

AMERICAN HOME PRODUCTS CORPORATION

3984285 - PROCESS FOR ENHANCING THE PRODUCTION OF ENTEROTOXIN BY ESCHERICHIA COLI AND VIBRIO CHOLERAE

BAYER AKTIENGESellschaft

3387434 - MICROBIOLOGICAL PRODUCTION OF INVERTASE

BEECHAM GROUP LIMITED

3966707 - PROCESS FOR PREPARING DOUBLE STRANDED RNA
3975520 - BIOLOGICALLY ACTIVE MATERIAL

BIOTRSEARCH, INC.

4256832 - CARCINOGEN AND MUTAGEN SCREENING METHOD AND APPARATUS

BOARD OF TRUSTEES OF THE LELAND STANFORD UNIVERSITY

4302204 - TRANSFER AND DETECTION OF NUCLEIC ACIDS

BURROUGHS WELLCOME CO.

3705782 - HETEROPLOID CELL LINES

CETUS CORPORATION

3950224 - METHOD FOR CLONING FILAMENTOUS MICROORGANISMS
4262030 - INTERFERON PRODUCTION
4293652 - METHOD FOR SYNTHESIZING DNA SEQUENTIALLY

CIBA-GEIGY CORPORATION

3567585 - PROCESS FOR OBTAINING BCG-CULTURES
3776815 - PROCESS FOR THE MANUFACTURE OF CEPHALOSPORIN C
3923601 - PROCESS FOR THE MANUFACTURE OF CEPHALOSPORIN C
4298692 - FERMENTATION PROCESS FOR PRODUCING A RIFAMYCIN DERIVATIVE

- ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING
- CPC INTERNATIONAL INC.
3813218 - PRODUCTION OF XULOSE (DEXTROSE) ISOMERASE ENZYME PREPARATIONS
3957587 - PRODUCTION OF XULOSE (DEXTROSE) ISOMERASE ENZYME PREPARATIONS
- ELI LILLY AND COMPANY
4115197 - PROCEDURE FOR OBTAINING PENICILLIUM SPECIES MUTANTS WITH IMPROVED ABILITY TO SYNTHESIZE MYCOPHENOLIC ACID
- ETABLISSEMENT ANI. CHEZ ME BECK. AVOCAT
4030976 - PROCESS FOR PREPARING A PRODUCT HAVING A BIOLOGICAL ACTIVITY
- FORSYTH DENTAL INFIRMARY FOR CHILDREN
4133875 - METHOD OF CONTROLLING DENTAL CAVITIES WITH STREPTOCOCCUS MUTANS MUTANT STRAINS
- GENERAL ELECTRIC COMPANY
3813316 - MICROORGANISMS HAVING MULTIPLE COMPATIBLE DEGRADATIVE ENERGY-GENERATING PLASMIDS AND PREPARATION THEREOF
3923597 - MERCURY CONCENTRATION BY THE USE OF MICROORGANISMS
3923603 - DISCRETE PLASMID CONSTRUCTION FROM CHROMOSOMAL GENES IN PSEUDOMONAS
4259444 - MICROORGANISMS HAVING MULTIPLE COMPATIBLE DEGRADATIVE ENERGY-GENERATING PLASMIDS AND PREPARATION THEREOF
- GESELLSCHAFT FÜR BIOTECHNOLOGISCHE FORSCHUNG MBH
4064011 - PROCESS FOR PRODUCING ECORI RESTRICTION ENDONUCLEASE WITH <1 E. COLI MUTANTS
4304863 - PROCESS FOR THE PRODUCTION OF HYBRID BACTERIA
- GIST-BROCADES N.V.
3855064 - PREPARATION OF A PROTEOLYTIC ENZYME
- GLAXO LABORATORIES LIMITED
2597318 - PRODUCTION OF DOUBLE STRANDED RIBONUCLEIC ACID
4075061 - METHOD FOR PRODUCING CEPHALOSPORINS
- GRUPPO LEPETIT S.P.A.
4276382 - ANTIBIOTIC SUBSTANCES
- GYOGYSZERKUTATO INTEZET
4294927 - GENETIC PROCESS FOR THE PREPARATION OF ANTIBIOTIC-PRODUCER MICROMONOSPORA STRAINS
- HOECHST AKTIENGESSELLSCHAFT
4195125 - PROCESS FOR OBTAINING INSULIN-PRODUCING ANIMAL CELLS
- HOFFMANN-LA ROCHE INC.
4189426 - RECOMBINANT HORMONAL COMPOSITIONS AND METHOD
- INSTITUTE FOR CANCER RESEARCH
4072574 - SYSTEM FOR IN VITRO ASSAY FOR MUTAGENICITY AND/OR CARCINOGENICITY OF CHEMICALS OR OTHER EXOGENOUS AGENTS
- INSTITUT FRANCAIS DU PETROLE
3930946 - YEASTS
3986933 - METHOD OF PREPARING YEASTS ENRICHED IN L-LYSINE AND CAPABLE OF EXCRETING ORGANIC ACIDS
- KERNFORSCHUNGSANLAGE JULICH GMBH
4039445 - MATRIX OF ALGAE AND METHOD OF MAKING SAME AND METHOD OF OBTAINING URANIUM FROM SEA WATER BY SAID MATRIX
4263403 - METHOD OF EXTRACTING URANIUM FROM SEA WATER
- KIKKOWAN SHYU CO., LTD.
4028184 - PROCESS FOR PRODUCING 3', 5' -CYCLIC ADENYLIC ACID

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

KYOWA HAKKO KOGYO CO., LTD
3620921 - PROCESS FOR PRODUCING 5'-INOSINIC ACID AND 5'-GUANYLIC ACID NUCLEOTIDES
4086137 - PROCESS FOR THE PRODUCTION OF L-ARGININE BY FERMENTATION

LABATT, JOHN LIMITED
3507750 - PROCESS FOR PREPARING MILK COAGULATING ENZYME COMPLEX

LIQUICHIMICA S.P.A.
3594596 - PROCESS FOR MUTATING YEAST

LOUISIANA STATE UNIVERSITY FOUNDATION
4278766 - MUTANT MICROORGANISMS USEFUL FOR THE PRODUCTION OF SINGLE CELL PROTEIN AND AMINO ACIDS

MASSACHUSETTS GENERAL HOSPITAL
4271145 - PROCESS FOR PRODUCING ANTIBODIES TO HEPATITIS VIRUS AND CELL LINES THEREFOR

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
3956275 - 2'-DEDXYSTREPTOMYCIN
3983544 - DERIVATIVES OF STREPTOMYCIN AND METHOD OF PRODUCING STREPTOMYCIN DERIVATIVES BY MUTATIONAL BIOSYNTHESIS
4066316 - ASSAY FOR MUTAGENESIS IN DIPLAID HUMAN LYMPHOBLASTS
4066316 - ASSAY FOR MUTAGENESIS IN DIPLAID HUMAN LYMPHOBLASTS
4302535 - ASSAY FOR MUTAGENESIS IN HETEROZYGOUS DIPLAID HUMAN LYMPHOBLASTS

MEIJI SEIKA KAISHA LTD.
3616243 - PROCESS FOR THE PRODUCTION OF AN ANTIBIOTIC SUBSTANCE 2'-AMINO-2'-DEDXY-KANAMYCIN IN HIGHER YIELD

MERCK + CO., INC.
3582469 - PRODUCTION OF DOUBLE-STRANDED RIBONUCLEIC ACID
3629235 - PROCESS FOR ISOLATING AN INTERFERON INDUCER AND THE PRODUCT PER SE

MITSUBISHI PETROCHEMICAL CO., LTD.
4276380 - PRODUCTION OF L-AMINO ACIDS

MIYAIRI KINZAI KENKYUSHO COMPANY LIMITED
3932670 - METHOD OF MANUFACTURING A BACTERIAL PREPARATION CONSISTING OF A NORMAL RUMEN BACTERIAL FLORA WITH AN IMPROVED ABILITY TO UTILIZE AMMONIUM SALTS

MONSANTO COMPANY
3436309 - MODIFYING STARCHES

MORINAGA MILK INDUSTRY CO., LTD.
3855063 - PROCESS FOR PRODUCING A MICROBIAL PROTEINOUS SUBSTANCE

NOVO INDUSTRI A/S
42566031 - PROTEASE PRODUCT OF REDUCED ALLERGENICITY

PFIZER INC.
4296203 - XANTHOMONAS BIPOLYMER FOR USE IN DISPLACEMENT OF OIL FROM PARTIALLY DEPLETED RESERVOIRS

PHILLIPS PETROLEUM COMPANY
3975234 - MICROBIAL PRODUCTION OF DICARBOXYLIC ACIDS

PIKOT LIMITED
4001080 - PRODUCTION OF IMMUNOLOGICAL MATERIALS

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

PRESIDENT AND FELLOWS OF HARVARD COLLEGE

4264737 - METHOD OF MAKING GENETICALLY STABLE MUTANTS OF +I VIBRIO CHOLERAE

RECHERCHE ET INDUSTRIES THERAPEUTIQUES, R.I.T.

3907986 - LIVE ATTENUATED INFECTIOUS BOVINE RHINOTRACHEITIS VIRUS VACCINES AND PREPARATION THEREOF

4008317 - VARTICELLA-ZOSTER VIRUS VACCINE AND PREPARATION THEREOF

REGENTS OF UNIVERSITY OF CALIFORNIA

4264731 - DNA JOINING METHOD

4283489 - PURIFICATION OF NUCLEOTIDE SEQUENCES SUITABLE FOR EXPRESSION IN BACTERIA

RESEARCH CORPORATION

4190495 - MODIFIED MICROORGANISMS AND METHOD OF PREPARING AND USING SAME

RIKAGAKU, KENKUSHO

4280261 - DEOXYRIBONUCLEASE AND PROCESS FOR ITS PREPARATION

4080261 - NOVEL ENDONUCLEASE AND PROCESS FOR PRODUCTION THEREOF

4259446 - PROCESS FOR PREPARATION OF DEOXYRIBONUCLEASES

SCHWEIZERISCHES SERUM- UNO IMPFENSTITUT UNO -

3856935 - ORAL TYPHOID VACCINE AND METHOD OF PREPARING THE SAME

SMITHKLINE CORPORATION

3821193 - ANTIVIRAL COMPLEX OF RNA AND POLYSACCHARIDE

4293546 - ANTHRACYCLINE ANTIBIOTICS PRODUCED BY +I STREPTOSPORANGIUM FRAGILIS +B SHEARER SP. NOV. ATCC 31519

SOCIETE D ASSISTANCE TECHNIQUE POUR PRODUITS NESTLE S.A.

3841967 - PROCESS FOR THE PRODUCTION OF ZEAXANTHIN

STANFORD UNIVERSITY, LELAND JUNIOR, THE BOARD OF TRUSTEES OF

4237224 - PROCESS FOR PRODUCING BIOLOGICALLY FUNCTIONAL MOLECULAR CHIMERAS

STERLING DRUG INC.

3972930 - AMINOCYCLOLIT ANTIBIOTICS

4028188 - AMINOCYCLOLIT ANTIBIOTICS

SVENSKA TRAFORSKNINGSINSTITUTET

3962033 - METHOD FOR PRODUCING CELLULOSE PULP

SVIBRON CORPORATION

4288545 - MICROBIOLOGICAL PROCESS FOR REMOVING OLEAGINOUS MATERIAL FROM WASTEWATER AND MICROBIOLOGICAL COMBINATION CAPABLE OF SAME

TAKEDA CHEMICAL INDUSTRIES LTD.

3616207 - METHOD FOR THE PRODUCTION OF 5'-INOSINIC ACID AND INOSINE

3689359 - METHOD FOR PRODUCING CITRIC ACID

3929577 - PRODUCTION OF CEPHALOSPORIN C

TALRES DEVELOPMENT (N.A.) N.V.

4235966 - PROCESS FOR THE PRODUCTION OF POLYSACCHARIDE

TANABE SEIYAKU CO. LTD.

3902967 - PROCESS FOR PRODUCING L-ARGININE BY FERMENTATION

UNITED STATES OF AMERICA, AGRICULTURE

4277564 - PREPARING ENTOMOCIDAL PRODUCTS WITH OLIGOSPOROGENIC MUTANTS OF BACILLUS THURINGIENSIS

MUTATION/GENETIC ENGINEERING

PAGE C

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

UNITED STATES OF AMERICA, ARMY

4275163 - CELLULOSE-PRODUCING MICROORGANISM

UNITED STATES OF AMERICA HEALTH EDUCATION AND WELFARE, MESNE

3992922 - TEMPERATURE-SENSITIVE RECOMBINANT MUTANT VIRUSES AND A PROCESS FOR PRODUCING SAME

UNIVERSITY OF CALIFORNIA, THE REGENTS OF

3976355 - MICROORGANISM GROWTH MEDIA AND THE STABILIZATION THEREOF

UNIVERSITY OF ILLINOIS FOUNDATION

3444043 - INTERFERENCE WITH BIOLOGICALLY ACTIVE RNA FORMATION

3661993 - REPLICATION OF MUTANT NUCLEIC ACIDS

3681993 - SYNTHESIS IN VITRO OF NUCLEIC ACIDS AND PRODUCTS USED THEREIN AND PRODUCTS PRODUCED THEREFROM

3689475 - SYNTHESIZED MUTANT RNA AND METHODS OF PREPARING SAME

UNIVERSITY OF MICHIGAN, THE REGENTS OF

3930956 - METHOD FOR THE GENETIC DETECTION OF MICROORGANISMS

4038143 - TEST KIT FOR THE GENETIC DETECTION OF MICROORGANISMS

UNIVERSITY OF MINNESOTA, THE REGENTS OF

3855408 - POULTRY VACCINE

4082613 - PROCESS FOR THE PRODUCTION OF INSULIN BY GENETICALLY TRANSFORMED FUNGAL CELLS

UNIVERSITY OF ROCHESTER

4302944 - ASPOBOGENOUS MUTANT OF +1 B. SUBTILIS \ FOR USE AS HOST COMPONENT OF HV1 SYSTEM

UPJOHN COMPANY

4029549 - PROCESS OF PRODUCING 9ALPHA-HYDROXY-3-KETOBI5NORCHOL-4-EN-22-OIC WITH MYCOBACTERIUM FORTUITUM

4062729 - MICROBIAL TRANSFORMATION OF STEROIDS

4211841 - PROCESS FOR MICROBIAL TRANSFORMATION OF STEROIDS

4271266 - PROCESS FOR PREPARING LINCOMYCIN

4273875 - PLASMID AND PROCESS OF ISOLATING SAME

4293844 - PROCESS FOR PREPARING ANDROST-4-ENE-3,17-DIONE

4293845 - PROCESS FOR PREPARING ANDROSTA-1,4-DIENE-3,17-DIONE AND ANDROST-4-ENE-3,17-DIONE

WISTAR INSTITUTE

4172124 - METHOD OF PRODUCING TUMOR ANTIBODIES

4196265 - METHOD OF PRODUCING ANTIBODIES

INVENTORS OF INDIVIDUALLY OWNED PATENTS (1/75-12/81) (ALPHA LISTING)

INVENTOR NAME	STREET	CITY	ST	ZIP/CNTRY
BALITSKAYA 4054489 -	ROZA MITROFANO METHOD OF PREPARING L-GLUTAMIC ACID AND ITS SODIUM SALT	MOSCOW		SU
BEARE 3951179 -	ABRAHAM SESTEL FLAT 28, HARVARD HOSPITAL, COO	SALISBURY, WILTSHIRE		EN
BELJANSKI 4264729 -	MIRKO METHOD AND REAGENT FOR DETECTING CANCERIGENIC AND ANTICANCEROUS SUBSTANCES	75005 PARIS		FR
DEBADOV 4278765 -	VLADIMIR G. METHOD FOR PREPARING STRAINS WHICH PRODUCE AMINOACIDS	MOSCOW		SU
EVSTUGOV-BABAEV 4054489 -	LEV MIKHAILOV METHOD OF PREPARING L-GLUTAMIC ACID AND ITS SODIUM SALT	MOSCOW		SU
FREDETTE 3936354 -	VICTORIEN ANTI-TUMOUR PRODUCT OF BACTERIAL ORIGIN	VILLE ST. LAURENT, Q		CA
GARNETT 3981775 -	JOHN LYNDON ENZYME INSOLUBILIZATION	LONGUEVILLE, NEW SOU		AU
KASATKINA 4054489 -	TATYANA BORTISOVNA METHOD OF PREPARING L-GLUTAMIC ACID AND ITS SODIUM SALT	MOSCOW		SU
KENYON 3981775 -	ROBERT SYDNEY ENZYME INSOLUBILIZATION	EASTWOOD, NEW SOUTH		AU
KHURGES 4278765 -	EVGENY M. METHOD FOR PREPARING STRAINS WHICH PRODUCE AMINOACIDS	MOSCOW		SU
KIT 4307189 -	MALON METHOD FOR THE QUANTITATIVE DETERMINATION OF TERMINAL DEOXYNUCLEOTIDYL TRANSFERASE IN BIOLOGICAL SAMPLES	HOUSTON TX 77024		
KOZLOV 4278765 -	JURY I. METHOD FOR PREPARING STRAINS WHICH PRODUCE AMINOACIDS	MOSCOW		SU
KOZYREVA 4237228 -	LUUDMILA F. METHOD OF PRODUCING L-ISOLEUCINE USING +I BREVIABACTERIUM FLAVUM	MOSCOW		SU
KUZNETSOVA 4054489 -	NATALYA NIKOLAEVNA METHOD OF PREPARING L-GLUTAMIC ACID AND ITS SODIUM SALT	MOSCOW		SU
LAPDANTE 3936354 -	JEAN-ROCK ANTI-TUMOUR PRODUCT OF BACTERIAL ORIGIN	CHOMEDEY LAVAL, QUEB		CA
LEONOVA 4237228 -	TATYANA V. METHOD OF PRODUCING L-ISOLEUCINE USING +I BREVIABACTERIUM FLAVUM	MOSCOW		SU
LIDDY 3981775 -	MICHAEL JAMES ENZYME INSOLUBILIZATION	CASTLE HILL, NEW SOU		AU
MCCAHON 3991179 -	DAVID INFLUENZA VACCINES	PIRBRIGHT, NEAR WOKI		EN

MUTATION/GENETIC ENGINEERING

PAGE D

INVENTORS OF INDIVIDUALLY OWNED PATENTS (1/75-12/81)			(ALPHA LISTING)	ST	ZIP/CNTRY
INVENTOR NAME	STREET	CITY			
ROZINDV	MIKHAIL N.	MOSCOW			SU
4278765	- METHOD FOR PREPARING STRAINS WHICH PRODUCE AMINOACIDS	3 FRUNZENSKAYA ULITS, 6, KV.			
SEO	BRIAN S.	SCARSDALE			10583
4286964	- POLYFUNCTIONAL EPOXIDES AND HALOXYORINS USED AS BRIDGING GROUPS TO BIND AROMATIC AMINE GROUP-CONTAINING ALCOHOLS	40 GRAHAM RD.			
SHAKULOV	RUSTEM S.	MOSCOW			SU
4278785	- METHOD FOR PREPARING STRAINS WHICH PRODUCE AMINOACIDS	ULITS KRAZNAGO MAYAKA, 14, KO			
SHOLIN	ALBERT FEODOROVIC	MOSCOW			SU
4054489	- METHOD OF PREPARING L-GLUTAMIC ACID AND ITS SODIUM SALT	TEPLY STAN, 1A MIKROBAION, KOR			
SUGIMOTO	KANAME	OKAYAMA			JP
4276282	- INTERFERON AND PREPARATIONS CONTAINING INTERFERON				
4285929	- TYPE II INTERFERON AND AGENTS THEREOF				
TYRRELL	DAVID ARTHUR	STANMORE, MIDDLESEX			EN
3991179	- INFLUENZA VACCINES	.29 THE RIDGEWAY			
YANKOVSKY	NIKOLAI K.	MOSCOW			SU
4278765	- METHOD FOR PREPARING STRAINS WHICH PRODUCE AMINOACIDS	ULITS VERKHNAYA RAOISCHEVSKAY			
YUEN	SHOKICHI	OKAYAMA			JP
4276282	- INTERFERON AND PREPARATIONS CONTAINING INTERFERON				
4285929	- TYPE II INTERFERON AND AGENTS THEREOF				
ZHOANOVA	NELLI I.	MOSCOW			SU
4237228	- METHOD OF PRODUCING L-ISOLEUCINE USING +I BREVIACETUM FLAVUM				
4278765	- METHOD FOR PREPARING STRAINS WHICH PRODUCE AMINOACIDS	LENINGRADSKOE SHOSSE, 112, KOR			
ZHOANOVA	NELLI ISAKOVNA	MOSCOW			SU
4054489	- METHOD OF PREPARING L-GLUTAMIC ACID AND ITS SODIUM SALT	LENINGRADSKOE SHOSSE, 112/1, K			

PATENTS (1/63-12/81) WITH NEITHER ASSIGNMENT NOR INVENTOR INFORMATION IN THE DATA BASE

PATENT DETECTION DEVICE		
3424655	- MUTANT DETECTION DEVICE	
3785926	- PROCESS FOR THE ENZYMIC REPRODUCTION OF INFORMATIONALLY ACTIVE RNA	
3819482	- METHOD OF PREPARING HIGH YIELDS OF DOUBLE STRANDED RIBONUCLEIC ACID	
3071518	3085946	3095359
3102080	3105014	3118820
3208909	3255095	3264194
3394008	3409505	

MUTATION/GENETIC ENGINEERING

FRONT PAGES OF SELECTED PATENTS

<u>Jan. -June 1, 1982</u>	<u>Selected</u>	
<u>U.S. Patents (25)</u>	<u>U.S. Patents (34)</u>	
4,328,209	4,276,282	4,237,224
4,332,898	4,275,163	4,196,265
4,332,900	4,278,766	4,133,875
4,332,901	4,275,157	4,237,228
4,332,899	4,273,875	4,115,197
4,332,892	4,259,446	4,189,426
4,332,897	4,271,145	4,172,764
4,332,893	4,264,731	3,966,707
4,326,029	4,259,444	4,082,613
4,331,589	4,263,403	4,080,261
4,329,448	4,262,090	4,064,011
4,331,764	4,264,737	4,072,574
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4,321,325	4,256,832	4,278,765
4,320,195	4,224,408	4,277,564
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4,316,962		
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United States Patent

Manis et al. (11) 4,332,900 Jun. 1, 1982

[54] CONSTRUCTION OF CO-INTEGRATE
STREPTOMYCIN AND ISCHIRICIA

[75] Inventors: Jack J. Manis, Portage; Sarah K. Highlander, Oshkosh Township, Kalamazoo County, both of Mich.
[73] Assignee: The Upjohn Company, Kalamazoo, Mich.

[21] Appl. No.: 192,727

[22] Filed: Oct. 1, 1980

[51] Int. Cl.¹ C12N 15/00; C12N 15/02;
[52] U.S. Cl. 435/253; 435/620; 435/849
[58] Field of Search 435/172, 253, 65, 317

[56] References Cited

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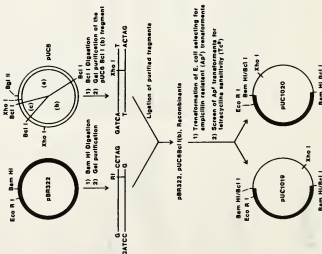
Murray et al. in *Recombinant DNA and Genetic Experimentation*, Morgan et al. (ed.) Pergamon Press, (1979), pp. 53-64.
Armstrong et al., Science 196, 172, (1977).
Bolivar, Gene 4, 121, (1978).
Primary Examiner—Alvin E. Tansholt
Assistant Examiner—James Martindale
Attorney, Agent, or Firm—Roman Sallwanchik

ABSTRACT

Novel chemical compounds, recombinant plasmids and host cells are disclosed. The compounds are not linkage of *Streptomyces sp.* plasmid pUC6 into the BamHI endonuclease site of the E. coli plasmid pUC19. The recombinant plasmids are used as cloning vehicles in recombinant DNA work. For example, using DNA methodology, a desired gene, for example, the gene for streptomycin resistance, can be inserted into the resulting plasmids and then be transformed into a suitable host microbe which, upon culturing, produces the desired insulin.

14 Claims, 5 Drawing Figures

CONSTRUCTION OF pBR322-pUC19 RECOMBINANT PLASMIDS



United States Patent

Goldstein (11) 4,332,901 Jun. 1, 1982

CLOWING VECTOR

[75] Inventor: Richard N. Goldstein, Cambridge, Mass.
[73] Assignee: President and Fellows of Harvard University, Cambridge, Mass.

[21] Appl. No.: 881,170

[22] Filed: Feb. 27, 1978

[51] Int. Cl.¹ C12N 7/00; C12N 15/00
[52] U.S. Cl. 435/256; 435/217
[58] Field of Search 435/172, 235, 317

[56] References Cited

Lanman et al., The Williams & Wilkins Co., pp. 723-727 (1965).

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Goldberg et al., Biochemistry of Genetic Engineering (1979).

Primary Examiner—Alvin E. Tansholt

ABSTRACT

A cloning vector useful in recombinant DNA (i.e. recombinant DNA) technology is disclosed. The vector is a satellite bacteriophage P4 or P4 viri and subsequent separation and purification of the mutant progeny in a cesium chloride gradient the mutant is found in a range of about 1.42 to 1.44 g/ml. The vector has peaks at about 1.42, 1.39, and 1.35 g/ml.

4 Claims, 1 Drawing Figure

United States Patent

Conney et al. (11) 4,332,899 Jun. 1, 1982

PROCESS FOR PRODUCING MALTASE

[75] Inventors: Charles L. Conney, Brookline; Charles J. Schaefer, Somerville, both of Mass.

[73] Assignee: Massachusetts Institute of Technology, Cambridge, Mass.

[21] Appl. No.: 177,709

[22] Filed: Aug. 13, 1980

[51] Int. Cl.¹ C12N 15/00; C12N 9/26
[52] U.S. Cl. 435/255; 435/940
[58] Field of Search 435/201, 255, 256, 172, 435/940

[56] References Cited

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Holmstrom et al., in Biochimica et Biophysica Acta, vol. 35, pp. 28-40 (1958).
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Primary Examiner—Luned M. Shapiro

Attorney, Agent, or Firm—Arthur A. Smith, Jr.; Paul J. Cook

ABSTRACT

Maltase is produced by growing a mutant of the yeast *Saccharomyces uvarum* capable of growing in a strain lacking maltose. The mutant is a derivative of the strain of *Saccharomyces uvarum* capable of utilizing sucrose as a carbon source also are provided.

7 Claims, No Drawings

[54] PROTEIN SYNTHESIS

- [75] Inventors: Mark Pashine, Gail D. Lauer; Thomas M. Roberts, all of Cambridge, Mass.; Keith C. Pashine, all of San Francisco, Calif.
[73] Assignee: President and Fellows of Harvard College, Cambridge, Mass.
[21] Appl. No.: 111,101
[22] Filed: Jan. 10, 1980

Related U.S. Application Data

- [63] Continuation of Ser. No. 3,102, Jan. 13, 1979, abandoned.
[51] Int. Cl.: C12P 21/00
[52] U.S. Cl.: 435/68; 435/70
[58] Field of Search: 435/172, 70, 68

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Backman et al., Cell, vol. 13, pp. 65-71, Jan. 1978.
Primary Examiner—Alvin E. Tannenholz

ABSTRACT

This invention is a process to produce specific proteins coded for by nucleotides for use in DNA-DNA hybridization. The invention, which uses recombinant DNA techniques, produces proteins in their natural, functional state unencumbered by extraneous peptides.

6 Claims, No Drawings

United States Patent
Nakano et al.

[54] NOVEL BACTERIOPHAGE AND METHOD FOR PREPARING SAME

- [75] Inventors: Eiichi Nakano, Saitama, Narinuma
Omics, all of Japan.
[73] Assignee: Noda Institute for Scientific Research, Noda, Japan
[21] Appl. No.: 895,002
[22] Filed: Apr. 12, 1978

- [30] Foreign Application Priority Data
Apr. 26, 1977 [JP] Japan 52/47409
[51] Int. Cl.: 435/172; 435/238
[52] U.S. Cl.: 435/235; 236, 72, 237
[58] Field of Search: 435/235, 236, 72, 237

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Article: Author—Kokisato et al., Title—Suppres-

United States Patent
Rosenberg

[54] PROCESS FOR THE PRODUCTION OF AN INSULIN-PRODUCING CELL LINE OF PANCREATIC BETA CELLS

- [76] Inventor: Ralph A. Rosenberg, 124 Johnson St., Apt. 1-b, Highland Park, N.J. 08904
[21] Appl. No.: 159,450
[22] Filed: Jan. 13, 1980

- [51] Int. Cl.: C12N 5/02; C12P 21/00; C12N 15/00
[52] U.S. Cl.: 435/240; 435/241; 435/172; 435/948
[58] Field of Search: 435/68, 172, 241, 238, 435/948, 235, 239, 240, 236

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16 Claims, No Drawings

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Kontarovsky et al., Monocloner Cell Culture of Adult Pancreatic Islets of Langerhans, Diabetologia 10:337-344, (1974).
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Cohen et al., Insulin Secretion from a Continuously Subcultured Islet Cell Line, J. Biol. Chem. 254:1919-1924, (1979).
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Primary Examiner—Eiichi M. Keppinger
Attorney, Agent, or Firm—Stibbey, Friedman & Leedom

ABSTRACT

A process for producing an insulin-producing conditionally transformed pancreatic cell line is provided. The process includes the steps of: (a) isolating and preparing pancreatic beta cells, preparing and culturing pancreatic beta cells, preparing and culturing a temperature sensitive mutant of an RNA virus, infecting the beta cells with the temperature sensitive virus. The infected pancreatic cells are conditionally transformed by the temperature sensitive mutant of the RNA virus in vivo application. Methods for evaluating the safety of the system for application in vivo are also disclosed.

United States Patent

4,326,029

United States Patent

4,329,448

Yukawa et al.

[11]

[45]

Apr. 20, 1982

[56] PROCESS FOR PRODUCTION OF LASPARTIC ACID

[75] Inventors: Hirosaki Yukawa, Teruhiko Nara, Yoshihiro Takayama, all of Ibaraki, Japan

[73] Assignee: Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

[21] Appl. No.: 177,044

[22] Filed: Aug. 11, 1980

[30] Foreign Application Priority Data

Aug. 10, 1979 [JP] Japan 54/01820

[51] Int. Cl. C12P 13/20

[52] U.S. Cl. 435/232, 435/840

[58] Field of Search 435/109, 172, 116, 232

[56] U.S. PATENT DOCUMENTS

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Primary Examiner—Lionel M. Shapiro
Attorney, Agent, or Firm—Sughrue, Mifflin, Zinn, MacKenzie and Sells

[57] ABSTRACT

Process for producing L-aspartic acid economically and efficiently from fumaric acid or a salt thereof and ammonia or ammonium salt using a cultured product obtained by aerobically culturing a microorganism belonging to the Genus *Brevibacterium* and having resistance to craniatoxin antibiotics.

2 Claims, No Drawings

United States Patent

4,331,589

United States Patent

4,331,764

Hung et al.

[11]

[45]

May 25, 1982

[56] DEOXYRIBONUCLEIC ACID SYNTHESIS USING CHROMOSOMAL PROTEIN EXTRACTED FROM CHICK EMBRYO FIBROBLASTS

[75] Inventors: Paul P. Hung, Wakegan; Shaw-Guang Lee, Libertyville, both of Ill.

[73] Assignee: Abbott Laboratories, North Chicago, Ill.

[21] Appl. No.: 254,726

[22] Filed: Apr. 16, 1981

[30] Related U.S. Application Data

Continuation-in-part of Ser. No. 112,267, Jan. 5, 1980, U.S. Pat. No. 4,264,445, Ser. No. 861,245, Nov. 22, 1978, Pat. No. 4,224,468.

[51] Int. Cl. C12N 1/20

[52] U.S. Cl. 260/413 R, 435/91

[58] Field of Search 260/112 R, 435/91

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Nature, vol. 259, No. 5543, pp. 499-502, Feb. 12, 1976.

Hung et al.

Levine et al., 270, No. 5613, pp. 366-369, Nov. 24, 1977.

Primary Examiner—Howard E. Schain

Attorney, Agent, or Firm—Gibido E. Fazio, Robert L. Niblack

[57] ABSTRACT

Described is a method of obtaining complete copying of the entire length of single stranded ribonucleic acid (RNA) into its complementary deoxyribonucleic acid (DNA) using a protein extract from chick embryo fibroblasts. The method can be used in recombinant DNA research to copy total messenger RNA into DNA.

1 Claim, 1 Drawing Figure

[54] MICROBIAL HETEROPOLYSACCHARIDE

[75] Inventors: Roger B. Cox, Reading, David C. Steer, Wirral, both of England

[73] Assignee: Lever Brothers Company, New York, N.Y.

[21] Appl. No.: 166,220

[22] Filed: Jul. 7, 1980

[30] Foreign Application Priority Data

Jul. 10, 1979 [GB] United Kingdom 7934049

Dec. 20, 1979 [GB] United Kingdom 7943878

[51] Int. Cl. C08B 123/36(194)

[52] U.S. Cl. 435/104-435/172, 426/458, 426/973, 426/944, 252/453 R, 252/174-177, 252/174-23, 524/22

[58] Field of Search 536/1, 4, 114, 435/101, 435/104

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Kelco Corp. Trade Brochure, pp. 1-36, 1976

Primary Examiner—Blondie Hazel

Attorney, Agent, or Firm—Irving N. Felt, James J. Parrell, Marvin H. Kurtz

[57] ABSTRACT

A heteropolysaccharide known as Bopolimer PS 87 comprises glucose, galactose, mannose, glucuronic acid and fucose. Bopolimer PS 87 is pseudoplastic, has a consistency at 20° C. of at least 150 poise and a yield stress of at least 100 dyne/cm². Bopolimer PS 87 is a genetically similar micro-organism and has many domestic and industrial uses as a suspending agent and thickener.

6 Claims, No Drawings

[56] PUBLICATIONS

Methods in Enzymology—vol. 6, pp. 524-528, (1963)

Primary Examiner—Lionel M. Shapiro

Attorney, Agent, or Firm—Felt & Lynch

[57] ABSTRACT

The new enzyme, semial plasma ribonuclease, has a molecular weight of 10,000, is active against poly(AU) against poly(U), 0.4-0.5 mM against poly(AU) and is inactive against native RNA. It is obtained either by placing dialyzed semial plasma on a chromatography column or by subjecting it to a chromatography step if desired, or by subjecting it directly to a chromatography step if desired. The enzyme is used for the efficient chromatography which bears in mind RNA or a non-hydrolyzable analog of the enzyme substrate.

4 Claims, 2 Drawing Figures

Hersberger

[54] PROCESS FOR TRANSFECTING

ESCHERICHIA COLI K12 X1776

[75] Inventor: Charles L. Hersberger, New Palestine, Ind.

[73] Assignee: Eli Lilly and Company, Indianapolis, Ind.

[21] Appl. No.: 911,852

[22] Filed: Jan. 2, 1978

[51] Int. Cl.¹ C12N 15/00
[52] U.S. Cl. 435/172; 435/849
[58] Field of Search 435/172

References Cited

[56] U.S. PATENT DOCUMENTS
4,190,495 2/1980 Curtis 435/172

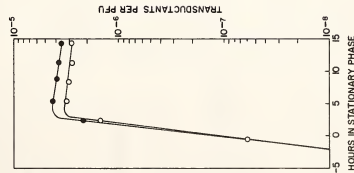
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Derwent Abstracts, (1978) (Abstracting German Offen. Pat. 2,644,412).
Attorney, Examiner, or Firm—Nancy J. Harrison; Arthur R. White

ABSTRACT

A method of providing maximum frequencies of transduction with *Escherichia coli* strains, such as *E. coli* K12 X1776, that are transduced poorly in the stationary phase of growth. *E. coli* K12 X1776 strains modified by transduction using this method are useful as EKK hosts for biological containment.

3 Claims, 1 Drawing Figure



Baxter et al.

[54] ADRENOCORTICOTROPIN-LIPOTROPIN

PRECURSOR GENE

[75] Inventors: John D. Baxter; James L. Roberts; Peter H. Seeborg; Howard M. Goodman, all of San Francisco, Calif.; John Slinec, Curran, Australia

[73] Assignee: The Regents of the University of California, Berkeley, Calif.

[21] Appl. No.: 972,430

[22] Filed: Dec. 22, 1978

[51] Int. Cl.¹ C12N 1/00
[52] U.S. Cl. 435/172; 435/252
[58] Field of Search 435/172; 435/252

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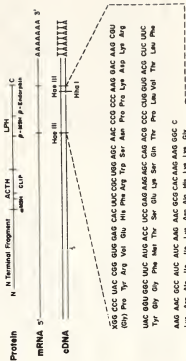
Primary Examiner—Alvin E. Tarenholtz

ABSTRACT

A technique suitable for cloning a cDNA having a base sequence coding for the ACTH/LPH precursor is disclosed. The invention is based on the use of a cDNA from a pituitary tumor cell line having a base sequence coding for the endorphin region. The fragment, hereinafter termed the endorphin gene cDNA sequence, was obtained from cultured mouse pituitary tumor cells known to produce the ACTH/LPH precursor protein.

8 Claims, 3 Drawing Figures

Closed Fragment of ACTH/Endorphin Precursor mRNA



NOVEL CELL LINE

- [54] Inventor: Dimitri Viza, Bourg-la-Reine, France
[73] Assignee: The International Institute of Differentiation Limited, Gurnsey, Channel Islands

- [21] Appl. No.: 860,439
[22] Filed: Dec. 14, 1977
[30] Foreign Application Priority Data
Dec. 16, 1976 (GB) United Kingdom 538,757/76
[51] Int. Cl.¹ C12N 01/09
[52] U.S. Cl. 435/253
[58] Field of Search 435/241, 435/241

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PREPARATION OF 11-DEOXY ANTHRACYCLINE ANTIBIOTICS

- [75] Inventors: Giuseppe Cassinelli, Pavia; Arnold Grein, Milan; Sergio Merli, Milan; Giovanni Rivola, Milan, all of Italy
[73] Assignee: Farmitalia Carlo Erba S.p.A., Milan, Italy

- [21] Appl. No.: 82,294
[22] Filed: Oct. 5, 1979

Related U.S. Application Data

- [62] Division of Ser. No. 9,450, Feb. 5, 1979, Pat. No. 4,307,545.

Foreign Application Priority Data

- [30] Feb. 17, 1979 (GB) United Kingdom 5246/78

- [51] Int. Cl.¹ C12P 19/06
[52] U.S. Cl. 435/253; 536/17 A; 424/181
[58] Field of Search 435/78, 172, 253

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INTERFERON INDUCER AND METHOD OF PREPARING SAME

- [75] Inventors: Hirofumi Arimura, Toyonaka; Masanori Nagai, Kyoto; Takeshi Nishimura, Osaka; Tadamasa Kitagawa, Nara; Masahito Kikuchi, Sayama, Kyoto, all of Japan

- [73] Assignee: The Green Cross Corporation, Osaka, Japan

- [21] Appl. No.: 58,361

- [22] Filed: Jul. 18, 1979

- [30] Foreign Application Priority Data
Jul. 20, 1978 (JP) Japan 53/9212

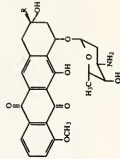
- [51] Int. Cl.¹ A61K 009/00; C12P 19/74
[52] U.S. Cl. 434/160; 424/85; 435/791; 435/194; 435/815; 435/116; 536/28; 536/29
[58] Field of Search 435/91, 92, 535/248; 536/28, 424/85, 200, 180

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Primary Examiner—Alvin E. Tannenholz
Attorney, Agent, or Firm—Hobbs, Cohen, Siegel & Gross

ABSTRACT

Antitumor antibiotics of the formula



wherein R is $\text{—CO—CH}_2\text{—OH}$ or $\text{—CH}_2\text{—OH}$. The compounds of the formula are novel antitumor antibiotics. The compounds of the formula are prepared by culturing a new mutant strain of microorganism designated as *Micromonospora purpurea* sp. nov. and which has been deposited with the American Type Culture Collection under number No. 31366 ATCC.

6 Claims, No Drawings

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Primary Examiner—Alvin E. Tannenholz
Attorney, Agent, or Firm—Cushman, Darby & Cushman

ABSTRACT

Double-stranded RNA synthesized using native human DNA as template is found to be an excellent interferon inducer. It is produced in the presence of ATP, GTP, CTP and UTP with one another in the presence of a native human DNA as template by the catalytic action of an RNA polymerase to form RNA and subjecting the resulting RNA to a double-stranded RNA polymerase of 70° to 100° C. and gradually cooling to room temperature or below to form double-stranded regions between their molecules.

4 Claims, 4 Drawing Figures

[54] INTERFERON AND PREPARATIONS FOR CONTAINING INTERFERON

[75] Inventors: Kenji Sugimoto; Shuichi Yuen, both of Okayama, Japan

[73] Assignees: Ken Hayashibara, Okayama, Shin Gakko, Hyogo, both of Japan

[21] Appl. No.: 5,485

[22] Filed: Jan. 22, 1979

[30] Foreign Application Priority Data

Jan. 22, 1978 [JP] Japan 53-588

Oct. 31, 1978 [JP] Japan 53-14026

[51] Int. Cl. A61K 45/02; A61K 39/00

[52] U.S. Cl. 424/85; 435/811

[53] Field of Search 424/85; 435/811

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Peter, "Interferon," 1966, pp. 263-266, North Holland Pub. Co.

[54] CELLULOSE-PRODUCING MICROORGANISM

[75] Inventor: Benedict J. Gallo, Natick, Mass.

[73] Assignee: The United States of America as represented by the Secretary of the Army, Washington, D.C.

[21] Appl. No.: 962,522

[22] Filed: Nov. 20, 1978

[30] Int. Cl. C12N 9/42; C12N 15/00

[51] U.S. Cl. 435/209; 435/172; 435/254; 435/945

[52] U.S. Cl. 435/267; 435/172

[53] Field of Search 435/209; 435/172

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Protein, Nucleic Acid and Enzyme, vol. 21, No. 4, pp. 616-643, "The Current Situation of the Maintenance and Preservation of Tissue Culture Cell Lines in Japan".

Primary Examiner—Debert R. Phillips

Attorney, Agent, or Firm—Brody and Neimark

ABSTRACT

The present invention relates to processes for an easily applicable industrial production of interferon and the possibilities of the products for preventing and treating interconferent diseases.

The process easily produces a large amount of interferon and transplanting established human cells to other cells.

allowing the animals to supply the cells with their nutrient body fluids, then exposing in vivo or in vitro the resultant cells to the action of interferon inducer. The interferon obtained by the present method is an effective and superior preparation for preventing and treating interconferent diseases.

8 Claims, No Drawings

[54] MUTANT MICROORGANISMS USEFUL FOR THE PRODUCTION OF SINGLE CELL PROTEIN AND AMINO ACIDS

[75] Inventors: Vedake R. Srinivasan, Baton Rouge, La.; Ye-Chia Chou, New Haven, Conn.

[73] Assignee: Louisiana State University Foundation, Baton Rouge, La.

[21] Appl. No.: 849,695

[23] Filed: Nov. 8, 1977

[30] Continued from Ser. No. 716,794, Aug. 30, 1976, Pat. No. 4,104,324

[51] Int. Cl. C12N 1/20

[52] U.S. Cl. 435/233; 435/110; 435/115; 435/172; 435/173

[53] Field of Search 435/110, 48, 115, 172, 435/232, 233, 822

[56] References Cited

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United States Patent [19]

Koprowski et al.

4,172,124

Oct. 23, 1979

United States Patent [19]

Hung et al.

4.224.408

1980 73 1980

[54]	METHODS OF PRODUCING TUMOR ANTIBODIES	
[75]	Inventors: Hilary Krocman, Wynnewood, Pa. and Carlo M. Croese, Philadelphia, both of Pa.	
[73]	Assignee: The Wistar Institute, Philadelphia, Pa.	
[21]	App. No. 901,102	
[22]	Apr. 28, 1978	
[51]	Int. Cl. ²	A61K 39/00; A61K 39/42; C12K 9/00
[52]	U.S. Cl.	424/245, 435/172, 435/240, 435/173
[58]	Field of Search	424/85, 86; 195/1.8

[19]	United States Patent	
[43]	Mar. 17, 1981	
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[54]	References Cited	
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[54]	PUBLICATIONS	
[75]	Primary Examiner-Sam Rosen	
[73]	ABSTRACT	
[75]	Antibodies demonstrating specificity for malignant tumors are produced by immunizing mice with hypoxanthine phosphoribosyltransferase deficient myeloma cells and spleen or lymph cells derived from an animal previously primed with tumor cells.	
[58]	16 Claims, No Drawings	

[54]	CARCINOGENS AND MUTAGEN SCREENING METHOD AND APPARATUS	Inventors: Eugene Findl, Antinville, Anthony M. Cusdell, Hantsville, both of N.Y.	Assignee: BioResearch Inc., Farmingdale, N.Y.	[73] Appl. No. 948,095	[75] Filed: Dec. 12, 1978	[73] Int. Cl.	[75] U.S. Cl.	[73] Assignee: BioResearch Inc., Farmingdale, N.Y.	[75] Filed: Dec. 12, 1978	[73] Int. Cl.	[75] U.S. Cl.	[73] Assignee: BioResearch Inc., Farmingdale, N.Y.	[75] Filed: Dec. 12, 1978	[73] Int. Cl.	[75] U.S. Cl.	[73] Assignee: BioResearch Inc., Farmingdale, N.Y.	[75] Filed: Dec. 12, 1978	[73] Int. Cl.	[75] U.S. Cl.	[73] Assignee: BioResearch Inc., Farmingdale, N.Y.	[75] Filed: Dec. 12, 1978	[73] Int. Cl.	[75] U.S. Cl.	[73] Assignee: BioResearch Inc., Farmingdale, N.Y.	[75] Filed: Dec. 12, 1978	[73] Int. Cl.	[75] U.S. Cl.	[73] Assignee: BioResearch Inc., Farmingdale, N.Y.	[75] Filed: Dec. 12, 1978	[73] Int. Cl.	[75] U.S. Cl.	[73] Assignee: BioResearch Inc., Farmingdale, N.Y.	[75] Filed: Dec. 12, 1978	[73] Int. Cl.	[75] U.S. Cl.	[73] Assignee: BioResearch Inc., Farmingdale, N.Y.	[75] Filed: Dec. 12, 1978	[73] Int. Cl.	[75] U.S. Cl.	[73] Assignee: BioResearch Inc., Farmingdale, N.Y.	[75] Filed: Dec. 12, 1978	[73] Int. Cl.	[75] U.S. Cl.	[73] Assignee: BioResearch Inc., Farmingdale, N.Y.	[75] Filed: Dec. 12, 1978	[73] Int. Cl.	[75] U.S. Cl.	[73] Assignee: BioResearch Inc., Farmingdale, N.Y.	[75] Filed: Dec. 12, 1978	[73] Int. Cl.	[75] U.S. Cl.	[73] Assignee: BioResearch Inc., Farmingdale, N.Y.	[75] Filed: Dec. 12, 1978	[73] Int. Cl.	[75] U.S. Cl.	[73] Assignee: BioResearch Inc., Farmingdale, N.Y.	[75] Filed: Dec. 12, 1978	[73] Int. Cl.	[75] U.S. Cl.	[73] Assignee: BioResearch Inc., Farmingdale, N.Y.	[75] Filed: Dec. 12, 1978	[73] Int. Cl.	[75] U.S. Cl.	[73] Assignee: BioResearch Inc., Farmingdale, N.Y.	[75] Filed: Dec. 12, 1978	[73] Int. Cl.	[75] U.S. Cl.	[73] Assignee: BioResearch Inc., Farmingdale, N.Y.	[75] Filed: Dec. 12, 1978	[73] Int. Cl.	[75] U.S. Cl.	[73] Assignee: BioResearch Inc., Farmingdale, N.Y.	[75] Filed: Dec. 12, 1978	[73] Int. Cl.	[75] U.S. Cl.	[73] Assignee: BioResearch Inc., Farmingdale, N.Y.	[75] Filed: Dec. 12, 1978	[73] Int. Cl.	[75] U.S. Cl.	[73] Assignee: BioResearch Inc., Farmingdale, N.Y.	[75] Filed: Dec. 12, 1978	[73] Int. Cl.	[75] U.S. Cl.	[73] Assignee: BioResearch Inc., Farmingdale, N.Y.	[75] Filed: Dec. 12, 1978	[73] Int. Cl.	[75] U.S. Cl.	[73] Assignee: BioResearch Inc., Farmingdale, N.Y.	[75] Filed: Dec. 12, 1978	[73] Int. Cl.	[75] U.S. Cl.	[73] Assignee: BioResearch Inc., Farmingdale, N.Y.	[75] Filed: Dec. 12, 1978	[73] Int. Cl.	[75] U.S. Cl.	[73] Assignee: BioResearch Inc., Farmingdale, N.Y.	[75] Filed: Dec. 12, 1978	[73] Int. Cl.	[75] U.S. Cl.	[73] Assignee: BioResearch Inc., Farmingdale, N.Y.	[75] Filed: Dec. 12, 1978	[73] Int. Cl.	[75] U.S. Cl.	[73] Assignee: BioResearch Inc., Farmingdale, N.Y.	[75] Filed: Dec. 12, 1978	[73] Int. Cl.	[75] U.S. Cl.	[73] Assignee: BioResearch Inc., Farmingdale, N.Y.	[75] Filed: Dec. 12, 1978	[73] Int. Cl.	[75] U.S. Cl.	[73] Assignee: BioResearch Inc., Farmingdale, N.Y.	[75] Filed: Dec. 12, 1978	[73] Int. Cl.	[75] U.S. Cl.	[73] Assignee: BioResearch Inc., Farmingdale, N.Y.	[75] Filed: Dec. 12, 1978	[73] Int. Cl.	[75] U.S. Cl.	[73] Assignee: BioResearch Inc., Farmingdale, N.Y.	[75] Filed: Dec. 12, 1978	[73] Int. Cl.	[75] U.S. Cl.	[73] Assignee: BioResearch Inc., Farmingdale, N.Y.	[75] Filed: Dec. 12, 1978	[73] Int. Cl.	[75] U.S. Cl.	[73] Assignee: BioResearch Inc., Farmingdale, N.Y.	[75] Filed: Dec. 12, 1978	[73] Int. Cl.	[75] U.S. Cl.	[73] Assignee: BioResearch Inc., Farmingdale, N.Y.	[75] Filed: Dec. 12, 1978	[73] Int. Cl.	[75] U.S. Cl.	[73] Assignee: BioResearch Inc., Farmingdale, N.Y.	[75] Filed: Dec. 12, 1978	[73] Int. Cl.	[75] U.S. Cl.	[73] Assignee: BioResearch Inc., Farmingdale, N.Y.	[75] Filed: Dec. 12, 1978	[73] Int. Cl.	[75] U.S. Cl.	[73] Assignee: BioResearch Inc., Farmingdale, N.Y.	[75] Filed: Dec. 12, 1978	[73] Int. Cl.	[75] U.S. Cl.	[73] Assignee: BioResearch Inc., Farmingdale, N.Y.	[75] Filed: Dec. 12, 1978	[73] Int. Cl.	[75] U.S. Cl.	[73] Assignee: BioResearch Inc., Farmingdale, N.Y.	[75] Filed: Dec. 12, 1978	[73] Int. Cl.	[75] U.S. Cl.	[73] Assignee: BioResearch Inc., Farmingdale, N.Y.	[75] Filed: Dec. 12, 1978	[73] Int. Cl.	[75] U.S. Cl.	[73] Assignee: BioResearch Inc., Farmingdale, N.Y.	[75] Filed: Dec. 12, 1978	[73] Int. Cl.	[75] U.S. Cl.	[73] Assignee: BioResearch Inc., Farmingdale, N.Y.	[75] Filed: Dec. 12, 1978	[73] Int. Cl.	[75] U.S. Cl.	[73] Assignee: BioResearch Inc., Farmingdale, N.Y.	[75] Filed: Dec. 12, 1978	[73] Int. Cl.	[75] U.S. Cl.	[73] Assignee: BioResearch Inc., Farmingdale, N.Y.	[75] Filed: Dec. 12, 1978	[73] Int. Cl.	[75] U.S. Cl.	[73] Assignee: BioResearch Inc., Farmingdale, N.Y.	[75] Filed: Dec. 12, 1978	[73] Int. Cl.	[75] U.S. Cl.	[73] Assignee: BioResearch Inc., Farmingdale, N.Y.	[75] Filed: Dec. 12, 1978	[73] Int. Cl.	[75] U.S. Cl.	[73] Assignee: BioResearch Inc., Farmingdale, N.Y.	[75] Filed: Dec. 12, 1978	[73] Int. Cl.	[75] U.S. Cl.	[73] Assignee: BioResearch Inc., Farmingdale, N.Y.	[75] Filed: Dec. 12, 1978	[73] Int. Cl.	[75] U.S. Cl.	[73] Assignee: BioResearch Inc., Farmingdale, N.Y.	[75] Filed: Dec. 12, 1978	[73] Int. Cl.
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[54]	DEOXYRIBONUCLEIC ACID SYNTHESIS USING BINDING PROTEIN	Inventors: Paul P. Hung, Waikgan; Shaw-guang Lee, Libertyville, both of Ill.	[73]	Assignees: Abbott Laboratories, Chicago, Ill.
[75]			[21]	App'l. No. 963,245
			[22]	Filed: Nov. 22, 1978
			[51]	Int. Cl. ¹ C12P 19/34
			[52]	U.S. Cl. 435/157; 435/172
			[53]	U.S. Cl. 435/157; 435/172
			[58]	Field of Search 195/1, 28 N; 435/91

54]	PROCESS FOR PRODUCING BIOLOGICALLY ACTIVE MOLECULAR CHIMERAS	Inventors: Stanley N. Cohen, Portola Valley; Herbert W. Boyer, Mill Valley, both of Calif.	Assignee: Board of Trustees of the Leland Stanford Jr. University, Stanford, Calif.	21] Apr. No. 1,021	Filed: Jan. 4, 1979	Related U.S. Application Data	Continuation-in-part of Ser. No. 958,284, Nov. 6, 1978, now U.S. Pat. 4,180,400, 4,287,500, 4,287,501, 4,287,502, 4,287,503, 4,287,504, 4,287,505, 4,287,506, 4,287,507, 4,287,508, 4,287,509, 4,287,510, 4,287,511, 4,287,512, 4,287,513, 4,287,514, 4,287,515, 4,287,516, 4,287,517, 4,287,518, 4,287,519, 4,287,520, 4,287,521, 4,287,522, 4,287,523, 4,287,524, 4,287,525, 4,287,526, 4,287,527, 4,287,528, 4,287,529, 4,287,530, 4,287,531, 4,287,532, 4,287,533, 4,287,534, 4,287,535, 4,287,536, 4,287,537, 4,287,538, 4,287,539, 4,287,540, 4,287,541, 4,287,542, 4,287,543, 4,287,544, 4,287,545, 4,287,546, 4,287,547, 4,287,548, 4,287,549, 4,287,550, 4,287,551, 4,287,552, 4,287,553, 4,287,554, 4,287,555, 4,287,556, 4,287,557, 4,287,558, 4,287,559, 4,287,560, 4,287,561, 4,287,562, 4,287,563, 4,287,564, 4,287,565, 4,287,566, 4,287,567, 4,287,568, 4,287,569, 4,287,570, 4,287,571, 4,287,572, 4,287,573, 4,287,574, 4,287,575, 4,287,576, 4,287,577, 4,287,578, 4,287,579, 4,287,580, 4,287,581, 4,287,582, 4,287,583, 4,287,584, 4,287,585, 4,287,586, 4,287,587, 4,287,588, 4,287,589, 4,287,590, 4,287,591, 4,287,592, 4,287,593, 4,287,594, 4,287,595, 4,287,596, 4,287,597, 4,287,598, 4,287,599, 4,287,600, 4,287,601, 4,287,602, 4,287,603, 4,287,604, 4,287,605, 4,287,606, 4,287,607, 4,287,608, 4,287,609, 4,287,610, 4,287,611, 4,287,612, 4,287,613, 4,287,614, 4,287,615, 4,287,616, 4,287,617, 4,287,618, 4,287,619, 4,287,620, 4,287,621, 4,287,622, 4,287,623, 4,287,624, 4,287,625, 4,287,626, 4,287,627, 4,287,628, 4,287,629, 4,287,630, 4,287,631, 4,287,632, 4,287,633, 4,287,634, 4,287,635, 4,287,636, 4,287,637, 4,287,638, 4,287,639, 4,287,640, 4,287,641, 4,287,642, 4,287,643, 4,287,644, 4,287,645, 4,287,646, 4,287,647, 4,287,648, 4,287,649, 4,287,650, 4,287,651, 4,287,652, 4,287,653, 4,287,654, 4,287,655, 4,287,656, 4,287,657, 4,287,658, 4,287,659, 4,287,660, 4,287,661, 4,287,662, 4,287,663, 4,287,664, 4,287,665, 4,287,666, 4,287,667, 4,287,668, 4,287,669, 4,287,670, 4,287,671, 4,287,672, 4,287,673, 4,287,674, 4,287,675, 4,287,676, 4,287,677, 4,287,678, 4,287,679, 4,287,680, 4,287,681, 4,287,682, 4,287,683, 4,287,684, 4,287,685, 4,287,686, 4,287,687, 4,287,688, 4,287,689, 4,287,690, 4,287,691, 4,287,692, 4,287,693, 4,287,694, 4,287,695, 4,287,696, 4,287,697, 4,287,698, 4,287,699, 4,287,700, 4,287,701, 4,287,702, 4,287,703, 4,287,704, 4,287,705, 4,287,706, 4,287,707, 4,287,708, 4,287,709, 4,287,710, 4,287,711, 4,287,712, 4,287,713, 4,287,714, 4,287,715, 4,287,716, 4,287,717, 4,287,718, 4,287,719, 4,287,720, 4,287,721, 4,287,722, 4,287,723, 4,287,724, 4,287,725, 4,287,726, 4,287,727, 4,287,728, 4,287,729, 4,287,730, 4,287,731, 4,287,732, 4,287,733, 4,287,734, 4,287,735, 4,287,736, 4,287,737, 4,287,738, 4,287,739, 4,287,740, 4,287,741, 4,287,742, 4,287,743, 4,287,744, 4,287,745, 4,287,746, 4,287,747, 4,287,748, 4,287,749, 4,287,750, 4,287,751, 4,287,752, 4,287,753, 4,287,754, 4,287,755, 4,287,756, 4,287,757, 4,287,758, 4,287,759, 4,287,760, 4,287,761, 4,287,762, 4,287,763, 4,287,764, 4,287,765, 4,287,766, 4,287,767, 4,287,768, 4,287,769, 4,287,770, 4,287,771, 4,287,772, 4,287,773, 4,287,774, 4,287,775, 4,287,776, 4,287,777, 4,287,778, 4,287,779, 4,287,780, 4,287,781, 4,287,782, 4,287,783, 4,287,784, 4,287,785, 4,287,786, 4,287,787, 4,287,788, 4,287,789, 4,287,790, 4,287,791, 4,287,792, 4,287,793, 4,287,794, 4,287,795, 4,287,796, 4,287,797, 4,287,798, 4,287,799, 4,287,800, 4,287,801, 4,287,802, 4,287,803, 4,287,804, 4,287,805, 4,287,806, 4,287,807, 4,287,808, 4,287,809, 4,287,810, 4,287,811, 4,287,812, 4,287,813, 4,287,814, 4,287,815, 4,287,816, 4,287,817, 4,287,818, 4,287,819, 4,287,820, 4,287,821, 4,287,822, 4,287,823, 4,287,824, 4,287,825, 4,287,826, 4,287,827, 4,287,828, 4,287,829, 4,287,830, 4,287,831, 4,287,832, 4,287,833, 4,287,834, 4,287,835, 4,287,836, 4,287,837, 4,287,838, 4,287,839, 4,287,840, 4,287,841, 4,287,842, 4,287,843, 4,287,844, 4,287,845, 4,287,846, 4,287,847, 4,287,848, 4,287,849, 4,287,850, 4,287,851, 4,287,852, 4,287,853, 4,287,854, 4,287,8
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- [54] METHOD OF PRODUCING ANTIBIOTICS
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[75] Inventors: Hilary Koprowski, Wynnewood, Pa.; Walter U. Gerbard, Carlo M. Cioes, both of Philadelphia, all of Pa.
[73] Assignee: The Wistar Institute, Philadelphia, Pa.

[21] Appl. No. 933,092

[22] Filed: Aug. 11, 1978

Related U.S. Application Data

[*] Continuation-in-part of Ser. No. 806,557, Jan. 15, 1977.

[51] Int. Cl. A61K 39/42

[52] U.S. Cl. A61K 1/02; A61K 39/42; A61K 42/82; A61K 42/86

[53] Field of Search 424/55, 86, 155/118

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[75] Inventors: Hilary Koprowski, Wynnewood, Pa.; Walter U. Gerbard, Carlo M. Cioes, both of Philadelphia, all of Pa.
[73] Assignee: The Wistar Institute, Philadelphia, Pa.

[21] Appl. No. 933,092

[22] Filed: Aug. 11, 1978

Related U.S. Application Data

[*] Continuation-in-part of Ser. No. 806,557, Jan. 15, 1977.

[51] Int. Cl. A61K 39/42

[52] U.S. Cl. A61K 1/02; A61K 39/42; A61K 42/82; A61K 42/86

[53] Field of Search 424/55, 86, 155/118

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USE OF PRODUCING L-ISOLEUCINE
USING BREVEBACTERIUM FLAVUM

- [76] Inventors: Nell T. Zhdanova, Leningradskoe shosse, 112, korpus 3, kv. 748, Moscow, U.S.S.R.; Vladimir A. Zhdanov, 81, korpus 5, kv. 452, Ljuzanin E. Kozeyeva, 4 Novopodmoskovy, Moscow, U.S.S.R.; and V. A. Zhdanov, 4, kv. 80, all of Moscow, U.S.S.R.

[21] Appl. No. 917,389

[22] Filed: Jun. 21, 1978

Foreign Application Priority Data

Jun. 29, 1977 [SU] U.S.S.R. 250119

[51] Int. Cl. C12P 19/06; C12N 1/00; C12R 1/13

[52] U.S. Cl. 424/306; 424/307; 424/308; 424/309; 424/310; 424/311; 424/312; 424/313; 424/314; 424/315; 424/316; 424/317; 424/318; 424/319; 424/320; 424/321; 424/322; 424/323; 424/324; 424/325; 424/326; 424/327; 424/328; 424/329; 424/330; 424/331; 424/332; 424/333; 424/334; 424/335; 424/336; 424/337; 424/338; 424/339; 424/340; 424/341; 424/342; 424/343; 424/344; 424/345; 424/346; 424/347; 424/348; 424/349; 424/350; 424/351; 424/352; 424/353; 424/354; 424/355; 424/356; 424/357; 424/358; 424/359; 424/360; 424/361; 424/362; 424/363; 424/364; 424/365; 424/366; 424/367; 424/368; 424/369; 424/370; 424/371; 424/372; 424/373; 424/374; 424/375; 424/376; 424/377; 424/378; 424/379; 424/380; 424/381; 424/382; 424/383; 424/384; 424/385; 424/386; 424/387; 424/388; 424/389; 424/390; 424/391; 424/392; 424/393; 424/394; 424/395; 424/396; 424/397; 424/398; 424/399; 424/400; 424/401; 424/402; 424/403; 424/404; 424/405; 424/406; 424/407; 424/408; 424/409; 424/410; 424/411; 424/412; 424/413; 424/414; 424/415; 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- [54] RECOMBINANT HORMONAL COMPOSITIONS AND METHOD
- [75] Inventor: Chab H. L. Berkeley, Calif.
- [73] Assignee: Hoffmann-La Roche, Inc., Nutley, N.J.
- [21] Appl. No.: 938,278
- [22] Filed: Aug. 31, 1978

Related U.S. Application Data

- [63] Continuation-in-part of Ser. No. 892,371, Apr. 3, 1978, 844,837, Oct. 14, 1977, abandoned, which is a continuation of Ser. No. 875,688, Apr. 12, 1976, abandoned.

- [51] Int. Cl.³ C07C 169/52; A61K 37/00
- [52] U.S. Cl. 260/112.5 R; 424/177
- [53] Field of Search 260/112.5 R; 424/177

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- [54] PROCESS FOR OBTAINING HYBRID STRAINS OF YEASTS

[75] Inventors: Henri Heald, Paris; Anne Provost, Paris; Philippe Fontaine, Versailles, all of France

[73] Assignee: Agence Nationale de Valorisation de la Recherche (ANVAR), Naully sur Seine, France

[21] Appl. No.: 824,937

[22] Filed: Sep. 20, 1977

[30] Foreign Application Priority Data

Sep. 21, 1976 [FR] France

[51] Int. Cl.³ C12K 1/02

[52] U.S. Cl. 435/248; 435/249; 435/259; 435/267

[53] Field of Search 159/82; 78, 79, 76, 195/1

- [54] PROCESS FOR PREPARING DOUBLE STRANDED RNA

[75] Inventors: Ernest Boris Chain, London; Kenneth William Buck, Crawley

Down; Jean Elizabeth Darbyshire, London; John Edgar Hargrave, London; Bollinghurst, Fred Himalay, London; Giulio Ratti, both of London, all of England

[73] Assignee: Boehringer Group Limited, United Kingdom

[21] Filed: Aug. 2, 1974

[22] Appl. No.: 494,334

Related U.S. Application Data

[60] Continuation of Ser. No. 265,635, Nov. 26, 1971, abandoned, which is a division of Ser. No. 124,496, March 15, 1971, abandoned

[52] U.S. Cl. 260/211.5 R; 195/15; 195/28 N; 424/85

[51] Int. Cl.³ C07C 21/02

[53] Field of Search 260/211.5 R

[56] References Cited

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3,629,235 12/1971 Lampson et al. 260/211.5 R

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Mayer et al., "Chem. Abst.", vol. 66, p. 109646b, 1964

Primary Examiner—Johnnie R. Brown

ABSTRACT

Virus particles capable of stimulating the production of double-stranded RNA from finger cells of the mouse *Myelocytoma* *for* and the nutrient medium in which or to which *Myelocytoma* *for* is added.

for and *Myelocytoma* *for* could be isolated from double-stranded RNA material can be isolated from *for* or *Myelocytoma* *for* and said RNA material is capable of stimulating production of interferon. Pharmaceutical compositions comprising said particles or said RNA material in combination with pharmaceutically acceptable carriers are also provided.

6 Claims, No Drawings

- [54] PROCESS FOR THE PRODUCTION OF INSULIN BY GENETICALLY TRANSFORMED FUNGAL CELLS

[75] Inventors: Madhavan J. Thirumalachar; Madhavan J. Narasimhan, both of Bangalore, India; John A. Anderson, St. Paul, Minn.

[73] Assignee: The Regents of the University of Minnesota, Minneapolis, Minn.

[21] Appl. No.: 679,566

[22] Filed: Apr. 23, 1976

[51] Int. Cl.³ C12D 13/02

[52] U.S. Cl. 195/87; 195/1; 195/28 N; 195/28 N; 424/85

[53] Field of Search 195/28 N; 76, 81.1

[56] References Cited

Venkath et al., Genetic Engineering, vol. II, p. 38, Elsevier Pub. Co., 1973.

Willmer, Cells and Tissues in Culture, vol. 2, p. 674, Academic Press, 1965.

Primary Examiner—Alvin E. Tuenholts

Attorney, Agent, or Firm—Burt, Bradlock & Burt

ABSTRACT

A process for the production of insulin using fungal cells. Human insulin producing cells are extracted to obtain the functional genome (the genetic material) which is used to transform fungal cells, making them capable of producing insulin. The insulin has been extracted and identified by radioimmuno assay and by bioassay. The same process can also be applied to produce other hormones.

functional insulinogenic species. The process for obtaining the functional genome of the human insulin producing cells is disclosed. The significance of the invention is related to the great need to produce human insulin in large quantities. The process is also related to the biological and clinical advantages when compared with the available animal insulins now used for the treatment of diabetes mellitus in man.

6 Claims, No Drawings

[54] TYPE II INTERFERON AND AGENTS

[75] Inventors: Kazuo Sugimoto, Shokichi Yum, and Osamu Ohno, Chugai Pharmaceutical Co., Ltd., Shiba Ashika, Higashi-Ku, Hayashibara, Okayama, both of Japan

[73] Assignees: Shiba Ashika, Higashi-Ku, Hayashibara, Okayama, both of Japan

[*] Notice: The portion of the term of this patent subsequent to Jun. 30, 1994, has been disclaimed.

[21] Appl. No.: 109,861

[22] Filed: Jan. 7, 1980

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 5,345, Jan. 22, 1979.

[30] Foreign Application Priority Data

Jan. 18, 1979 [JP] Japan

[31] Int. Cl.¹ A61K 39/00

[32] U.S. Cl. 424/805; 424/806; 424/807; 424/808; 424/809; 424/810; 424/811

[58] Field of Search 424/805; 424/806; 424/807; 424/808; 424/809; 424/810; 424/811

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Anjison et al., "Partial Purification of Human Interferon by Affinity Chromatography", 1974.

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Interferon, by S. Kobayashi, Kodansha, Ltd., Tokyo, Japan, 1975.

[54] MODIFIED MICROORGANISMS AND METHODS OF PREPARING AND USING SAME

[75] Inventor: Roy Curtiss, III, Birmingham, Ala.

[73] Assignee: Research Corporation, New York, N.Y.

[21] Appl. No.: 727,265

[22] Filed: Sep. 27, 1976

[31] Int. Cl.¹ C12K 1/02

[32] U.S. Cl. 435/172; 435/173; 435/174; 435/175; 435/176; 435/177; 435/178; 435/179; 435/180; 435/181; 435/182; 435/183; 435/184; 435/185; 435/186; 435/187; 435/188; 435/189; 435/190; 435/191; 435/192; 435/193; 435/194; 435/195; 435/196; 435/197; 435/198; 435/199; 435/200; 435/201; 435/202; 435/203; 435/204; 435/205; 435/206; 435/207; 435/208; 435/209; 435/210; 435/211; 435/212; 435/213; 435/214; 435/215; 435/216; 435/217; 435/218; 435/219; 435/220; 435/221; 435/222; 435/223; 435/224; 435/225; 435/226; 435/227; 435/228; 435/229; 435/230; 435/231; 435/232; 435/233; 435/234; 435/235; 435/236; 435/237; 435/238; 435/239; 435/240; 435/241; 435/242; 435/243; 435/244; 435/245; 435/246; 435/247; 435/248; 435/249; 435/250; 435/251; 435/252; 435/253; 435/254; 435/255; 435/256; 435/257; 435/258; 435/259; 435/260; 435/261; 435/262; 435/263; 435/264; 435/265; 435/266; 435/267; 435/268; 435/269; 435/270; 435/271; 435/272; 435/273; 435/274; 435/275; 435/276; 435/277; 435/278; 435/279; 435/280; 435/281; 435/282; 435/283; 435/284; 435/285; 435/286; 435/287; 435/288; 435/289; 435/290; 435/291; 435/292; 435/293; 435/294; 435/295; 435/296; 435/297; 435/298; 435/299; 435/300; 435/301; 435/302; 435/303; 435/304; 435/305; 435/306; 435/307; 435/308; 435/309; 435/310; 435/311; 435/312; 435/313; 435/314; 435/315; 435/316; 435/317; 435/318; 435/319; 435/320; 435/321; 435/322; 435/323; 435/324; 435/325; 435/326; 435/327; 435/328; 435/329; 435/330; 435/331; 435/332; 435/333; 435/334; 435/335; 435/336; 435/337; 435/338; 435/339; 435/340; 435/341; 435/342; 435/343; 435/344; 435/345; 435/346; 435/347; 435/348; 435/349; 435/350; 435/351; 435/352; 435/353; 435/354; 435/355; 435/356; 435/357; 435/358; 435/359; 435/360; 435/361; 435/362; 435/363; 435/364; 435/365; 435/366; 435/367; 435/368; 435/369; 435/370; 435/371; 435/372; 435/373; 435/374; 435/375; 435/376; 435/377; 435/378; 435/379; 435/380; 435/381; 435/382; 435/383; 435/384; 435/385; 435/386; 435/387; 435/388; 435/389; 435/390; 435/391; 435/392; 435/393; 435/394; 435/395; 435/396; 435/397; 435/398; 435/399; 435/400; 435/401; 435/402; 435/403; 435/404; 435/405; 435/406; 435/407; 435/408; 435/409; 435/410; 435/411; 435/412; 435/413; 435/414; 435/415; 435/416; 435/417; 435/418; 435/419; 435/420; 435/421; 435/422; 435/423; 435/424; 435/425; 435/426; 435/427; 435/428; 435/429; 435/430; 435/431; 435/432; 435/433; 435/434; 435/435; 435/436; 435/437; 435/438; 435/439; 435/440; 435/441; 435/442; 435/443; 435/444; 435/445; 435/446; 435/447; 435/448; 435/449; 435/450; 435/451; 435/452; 435/453; 435/454; 435/455; 435/456; 435/457; 435/458; 435/459; 435/460; 435/461; 435/462; 435/463; 435/464; 435/465; 435/466; 435/467; 435/468; 435/469; 435/470; 435/471; 435/472; 435/473; 435/474; 435/475; 435/476; 435/477; 435/478; 435/479; 435/480; 435/481; 435/482; 435/483; 435/484; 435/485; 435/486; 435/487; 435/488; 435/489; 435/490; 435/491; 435/492; 435/493; 435/494; 435/495; 435/496; 435/497; 435/498; 435/499; 435/500; 435/501; 435/502; 435/503; 435/504; 435/505; 435/506; 435/507; 435/508; 435/509; 435/510; 435/511; 435/512; 435/513; 435/514; 435/515; 435/516; 435/517; 435/518; 435/519; 435/520; 435/521; 435/522; 435/523; 435/524; 435/525; 435/526; 435/527; 435/528; 435/529; 435/530; 435/531; 435/532; 435/533; 435/534; 435/535; 435/536; 435/537; 435/538; 435/539; 435/540; 435/541; 435/542; 435/543; 435/544; 435/545; 435/546; 435/547; 435/548; 435/549; 435/550; 435/551; 435/552; 435/553; 435/554; 435/555; 435/556; 435/557; 435/558; 435/559; 435/560; 435/561; 435/562; 435/563; 435/564; 435/565; 435/566; 435/567; 435/568; 435/569; 435/570; 435/571; 435/572; 435/573; 435/574; 435/575; 435/576; 435/577; 435/578; 435/579; 435/580; 435/581; 435/582; 435/583; 435/584; 435/585; 435/586; 435/587; 435/588; 435/589; 435/590; 435/591; 435/592; 435/593; 435/594; 435/595; 435/596; 435/597; 435/598; 435/599; 435/600; 435/601; 435/602; 435/603; 435/604; 435/605; 435/606; 435/607; 435/608; 435/609; 435/610; 435/611; 435/612; 435/613; 435/614; 435/615; 435/616; 435/617; 435/618; 435/619; 435/620; 435/621; 435/622; 435/623; 435/624; 435/625; 435/626; 435/627; 435/628; 435/629; 435/630; 435/631; 435/632; 435/633; 435/634; 435/635; 435/636; 435/637; 435/638; 435/639; 435/640; 435/641; 435/642; 435/643; 435/644; 435/645; 435/646; 435/647; 435/648; 435/649; 435/650; 435/651; 435/652; 435/653; 435/654; 435/655; 435/656; 435/657; 435/658; 435/659; 435/660; 435/661; 435/662; 435/663; 435/664; 435/665; 435/666; 435/667; 435/668; 435/669; 435/670; 435/671; 435/672; 435/673; 435/674; 435/675; 435/676; 435/677; 435/678; 435/679; 435/680; 435/681; 435/682; 435/683; 435/

MUTATION/GENETIC ENGINEERING

FOREIGN PATENT DOCUMENTS

Because of the importance of international patent activity in the field of genetic engineering, this profile includes a list of recent foreign patent documents in the International Patent Classification "Genetic Engineering" (Cl2N 15/00). The documents listed were published between August, 1980 and March, 1982.

Since a patent is enforceable only in the country which grants it, it is common practice to seek patent protection on a single invention in several countries. This multiple patent application filing results in the issuance of several patent documents, each from a different country, but all to the same invention. Such patents form a "family."

The documents listed in this section represent the first patent in a family to be published in a "major" country*. In some cases, no other family patents have, as yet, been granted. To eliminate duplication of the information, any patents which, at the present time, have a corresponding U.S. patent in the family are not included.

The following Table includes the publication date, the patent document number, the origin of the document, the subject of the disclosure, and the assignee or inventor.

The data resource used for this selection of patents is the data base developed by Derwent Publications Ltd., of London. By special arrangement, Derwent, a commercial patent information firm, has provided its data base to the U.S. Patent and Trademark Office for various purposes, including support of patent activity analysis.

*"Major" country is defined by Derwent Publications, Ltd., the developer of the data base used in selecting this information. Documents published in a "major" country include, among others, those published by the United States, Belgium, Federal Republic of Germany, France, Great Britain, the Netherlands, Japan and the Soviet Union. The expression also includes documents published by the European Patent Office, as well as "World Patents," which are published international applications filed under the Patent Cooperation Treaty.

DATE	DOCUMENT NO.	DOCUMENT ORIGIN*	SUBJECT MATTER	ASSIGNEE or INVENTOR
02-17-82	029229	JA	Breeding novel matsutake fungus	Topo Kogyo KK
03-24-82	48081	EP	DNA for replication and stable mitotic maintenance in host	University of California
03-17-82	47600	EP	DNA transfer vectors coding for bovine growth hormone	University of California
02-05-82	022697	JA	Insulin production	H. Taniguchi
02-05-82	2487851	FR	Human insulin production by culturing human cells	Hayashibara Seibutsu
03-03-82	46669	EP	New somatostatin and precursors	University of California
01-22-82	012994	JA	Restriction endonuclease preparation from <i>Thermus thermophilus</i> culture	Mitsubishi Chem Ind
01-22-82	2486961	FR	Mutant strain of <i>Escherichia coli</i>	Unisearch Ltd
02-17-82	46039	EP	Synthetic genes coding for urogastrone expression	G D Searle & Co
02-10-82	43573	EP	Eukaryotic autonomously replicating segment	Stanford University
10-22-81	135498	JA	Plasmid antibiotic material preparation	UpJohn Co
01-21-82	00158	WO	Amplification of eukaryotic genes in mammalian cells	Salk Inst for Biological Studies
04-27-81	823427	SU	Microbial lysogenic clone production	Rost Anti-Plague
04-27-81	823426	SU	Proton bacterium sherman11-149 microbial strain	Altal Butter Cheese
12-24-81	2485037	FR	Bacterial strain of <i>Leuconostoc</i> B-44-40	J. Silver
01-27-82	44722	EP	Human hybridoma cell production and monoclonal antibodies	Stanford University
01-27-81	44710	EP	Synthetic specific antigenic determinants	Scripps Clinic & Research Foundation
01-27-81	44441	EP	Monoclonal antibodies to drugs	Scripps-Willies Inc.
09-07-81	756839	SU	Microbiological production of protease	AS USSR Microbiol
12-18-81	2484448	FR	Preparation of L-arginine by fermentation	Ajinomoto KK
01-20-82	2079291	GB	Mature human leukocyte interferon polypeptides	Hoffmann-LaRoche; Genentech Inc
01-13-82	43718	EP	Rat myeloma cell line not expressing immunoglobulin chain	National Res Dev Corp
01-13-82	2078731	GB	Fermentative production of L-tryptophan	Showa Denko KK
01-06-82	43075	EP	Incorporating genetic material into intact cells	Studengesellschaft Kohle MBH
12-24-81	03663	WO	Human cell line derived from hepatic tumor	Wistar Inst Anatomy
12-23-81	42246	EP	Non-glycosylated human fibroblast interferon	Japan Cancer Res; Harvard College
11-20-81	2482622	FR	Lysine production by culturing <i>Corynebacterium</i> or <i>Brevibacterium</i>	Ajinomoto KK
12-16-81	41767	EP	Cloning vectors containing lambda-phage promoter and operator	Biogen NV
12-11-81	889182	BE	Live herpes simplex vaccine	Asta Werke AG
12-10-81	03498	WO	Stimulating production of gamma interferon	New York University
12-09-81	41313	EP	DNA sequences and recombinant DNA molecules transformed hosts	Biogen NV

*KEY TO ABBREVIATIONS

BE Belgium
 DE Federal Republic of Germany
 EP European Patent
 FR France
 GB Great Britain
 JA Japan
 NL Netherlands
 SU Soviet Union
 WO Published International Application (Patent Cooperation Treaty)

DATE	DOCUMENT NO.	DOCUMENT ORIGIN*	SUBJECT MATTER	ASSIGNEE OR INVENTOR
12-09-81	2076853	GB	High yield fermentation production of L-glutamic acid	Ajinomoto KK
12-02-81	40963	EP	Hybrid plasmid p1c1021	Upjohn Co
12-02-81	40922	EP	Polyptides with foot and mouth disease antigen specificity	Biogen NV
11-25-81	40466	EP	Adaptor oligo-nucleotide containing recognition site	Canadian Pat & Dev Ltd
10-23-81	2480782	FR	Highly specific antibody production	T. Hamada
11-18-81	39743	EP	Small recombinant DNA plasmid rings	MicroLife Technics
10-16-81	8101349	NL	Live vaccines against bacterial infection	Ramot University
11-11-81	2075056	GB	Proline producing <i>Escherichia</i> transformant	Ajinomoto KK
11-11-81	2075055	GB	Methionine producing <i>Escherichia</i> transformant	Ajinomoto KK
10-28-81	38765	EP	Transforming cells with hepatitis virus DNA	Inst Pasteur; Inst Nat Sante Recherche Mediale
10-28-81	38642	EP	Monoclonal antibodies to hepatitis B surface antigen	National Research Development Corp
10-21-81	38182	EP	Synthesis of mature protein or polypeptide	Harvard College
10-21-81	38156	EP	Plasmid PUC 10 of molecular weight 6.8 mega-daltons	Upjohn Co
10-15-81	102899	WO	Monoclonal antibody having specificity to interferon-alpha	D. S. Sechter
10-14-81	37723	EP	Cloned DNA segments for expression in eucaryotic cells	University of California
10-14-81	37687	EP	Recombinant DNA segment for insertion into plasmid	Abbott Laboratories
01-23-81	798173	SU	Alpha-galactosidase microbiological production	AS USSR Biochem Ins
01-23-81	798172	SU	Microbiological production of citric acid	Lengd Food Ind Res
10-14-81	2073245	GB	Bovine growth hormone from new strains of E coli	Yeda Res & Dev Co Ltd
10-07-81	37273	EP	Genetically modified autotrophic or methylotrophic bacteria	Imperial Chem Industries Ltd
08-31-81	109587	JA	Genetically recombined <i>Corynebacterium</i> microbial strain preparation	Kyowa Hakkio Kogyo KK
09-30-81	36776	EP	Production of polypeptides from recombinant bacteria	Genentech Inc
09-23-81	36259	EP	Production of predetermined protein	Cetus Corp
09-23-81	36258	EP	Aspartame production from synthetic polypeptide	Cetus Corp
09-16-81	35914	EP	Cointegrate plasmids from <i>E. coli</i> and <i>Streptomyces</i> <i>spinosus</i> DNA	Upjohn Co
09-16-81	35831	EP	Glutamate dehydrogenase gene containing microorganism	Imperial Chem Industries Ltd
09-16-81	35781	EP	Manufacturing transfer vector containing sequence for mammalian peptide	University of California
09-03-81	02426	WO	Insertion of DNA into eucaryotic cells by co-transformation	R. Axel
09-03-81	02425	WO	Eucaryotic cells co-transformed with DNA linked to promoter	R. Axel

*KEY TO ABBREVIATIONS

BE	Belgium	FR	France	NL	Netherlands
DE	Federal Republic of Germany	GB	Great Britain	SU	Soviet Union
EP	European Patent	JA	Japan	WO	Published International Application (Patent Cooperation Treaty)

DATE	DOCUMENT NO.	DOCUMENT ORIGIN*	SUBJECT MATTER	ASSIGNEE or INVENTOR
09-09-81	35454	EP	Desacetyl-tyrosin alpha 1 with immunostimulant activity	Genentech Inc
09-09-81	35384	EP	Deoxy nucleotide linkers for cloned DNA coding sequences	University of California
07-27-81	092784	JP	Acetic acid requiring Brevibacterium	Ajinomoto KK
08-26-81	34307	JA	Microbiologically produced interferon polypeptide	Hoechst AG
07-16-81	087600	JA	Recombinant containing transcriptase genes	Gan Kenkyukai ZH
08-26-81	2069504	GB	Microbiologically prepared human interferon	Hoechst AG
08-26-81	2069503	GB	Recombinant DNA containing amylase coding gene	OPC International Inc
12-09-81	785359	SU	Pseudomonas aeruginosa microbial strain	AS UKR Colloid Chem
12-09-81	785358	SU	Achromobacter auridica TK microbial strain	AS UKR Colloid Chem
12-09-80	785357	SU	Micrococcus aurantiacus variety Micrococcus rubescens 53	AS Kaza Microbiol
08-19-81	2068969	GB	Expression of gene coding by fusing gene	UpJohn Co
07-03-81	2472610	FR	Fermentative L-glutamic acid production	Ajinomoto KK
08-12-81	33702	EP	2-Nitro substituted naphthofuran derivatives	Agence Nat Valorisation Recherche
08-12-81	33579	EP	Monoclonal antibody reactive with monocytes and granulocytes	Ortho Pharm Corp
08-12-81	33578	EP	Monoclonal antibody reactive with peripheral T cells and thymocytes	Ortho Pharm Corp
08-12-81	33439	EP	20-Carboxy-pregna-1,4,17(20)-trienone and its methyl ester	Henkel KGAA
07-30-81	2067574	GB	Polypeptide with amino acid sequence of primate proinsulin	Hoechst AG
06-12-81	2470797	FR	Coproporphyrin III production by cultivation of Arthrobacter species	Nippon Oil KK
07-22-81	32238	EP	Recombination bacteriophage for heterologous cloning of DNA	Rochester University
07-16-81	887991	BE	Optimisation of Polypeptide production by microorganisms	Harvard College
11-15-81	779383	SU	Acid proteinase microbiological production	Antibiotics Enzymes
07-15-81	32134	EP	DNA sequences coding for interferon-like polypeptides	Biogen NV
05-29-81	2469456	FR	Uroporphyrin III production by culture of Arthrobacter strains	Nippon Oil KK
05-29-81	2469454	FR	Hybrid plasmids of yeast	Agence Nat Valorisation Recherche
10-23-80	773073	SU	Sparkling muscatel wine production	AS USSR Dagestan
10-23-80	773072	SU	Yeast strain Saccharomyces cerevisiae	Protein Biosynth
10-15-80	771159	SU	Microbiological production of neutral proteinase	AS Lith Blochem Ins
06-24-81	30815	EP	New monoclonal antibody against particular human thymocyte antigen	Ortho Pharm Corp
06-24-81	30814	EP	Monoclonal antibody against particular human thymocyte antigen	Ortho Pharm Corp
06-24-81	30727	EP	High yield microbiological production of L-valine	Ajinomoto KK
06-17-81	30450	EP	Hybridoma ATCC CRL-8014	Ortho Pharm Corp
06-17-81	30449	EP	Hybridoma ATCC CRL-8020	Ortho Pharm Corp
06-17-81	30391	EP	Production of L-glutamic acid	Ajinomoto KK

*KEY TO ABBREVIATIONS

BE	Belgium	FR	France	NL	Netherlands
DE	Federal Republic of Germany	GB	Great Britain	SU	Soviet Union
EP	European Patent	JA	Japan	WO	Published International Application (Patent Cooperation Treaty)

MUTATION/GENETIC ENGINEERING: FOREIGN PATENT DOCUMENTS

DATE	DOCUMENT NO.	DOCUMENT ORIGIN*	SUBJECT MATTER	ASSIGNEE OR INVENTOR
10-03-80	767204	SU	Production of extra cellular exo-nuclease	Bio-Eng Res Inst
06-01-81	887397	BE	Gene for expressing protein similar to human Interferon	G. D. Searle & Co
06-10-81	2063882	GB	Highly purified human Interferon preparation	Yeda Res & Dev Co Ltd; Inst Pasteur
05-14-81	887290	BE	Synthetic gene containing repeating codon sequence	G. D. Searle & Co
09-23-80	765359	SU	Yeast strain Candida krusei	Siba Tech Inst
04-15-81	039790	JA	Yeast body preparation via protoplast fusion	Noda Inst Sci Res
04-15-81	039778	JA	Variety of Corynebacterium glutamicum	Ajinomoto KK
09-10-80	761561	SU	Alkaline protease microbiological production	Appl Enzymology Res
04-14-81	039099	JA	Plasmids with decomposing properties	Mitsubishi Chem Ind
04-10-81	2464300	FR	Preparation of strains of Salmonella abortus ovis	Inst Nat Recherche Agronomique
04-10-81	2464299	FR	Preparation of strains producing amino acids	Genetics & Ind Mtr
05-20-81	28902	EP	Monoclonal antibody production	Bio-Response Inc
04-08-81	035981	JA	Bacterium variant strain	Ajinomoto KK
08-10-80	753897	SU	Aspergillus awamori fungal strain	Ferment Prods Res
05-06-81	28033	EP	DNA coding for polypeptide with Interferon activity	Japanese Cancer Res; Gan Kenkyukai ZH
03-20-81	2462476	FR	Cosmids with gene for kanamycin resistance	Inst Pasteur; ANVAR
04-29-81	27662	EP	Eukaryotic cells containing DNA inserted via lipid vesicles	Max Planck Gesellschaft Wissenschaften
02-06-81	2496585	FR	Genetically engineered proteins for nutrition	Inst Pasteur
02-03-81	011792	JA	Production of DNA relaxing enzyme	Rikagaku Kenkyusho
03-05-81	00577	WO	Nucleic acid coding for hepatitis B antigen	Inst Pasteur; F. Gallbert; Inst Nat Sante Recherche Medcale; ANVAR
01-20-81	005093	JA	Heat-resisting enzyme preparation	Mitsubishi Chem Ind
03-11-81	2055805	GB	Fermentative production of L-histidine	Ajinomoto KK
02-11-81	23882	EP	Plasmid vectors and bacteria containing alkaline phosphatase gene	Scherling AG
02-12-81	3027922	DE	L-lysine production by fermentation	Ajinomoto KK
02-11-81	2053906	GB	L-phenylalanine by fermentation of mutants	Ajinomoto KK
02-04-81	23597	EP	Hetero-polysaccharide biopolymer PS 87	Unilever Ltd
02-03-81	2930794	DE	Preparation of microorganisms with constitutive acylase	Gesellschaft Biotech Forschung
11-25-80	150893	JA	Arthrobaacter simplex microbes	Mitsubishi Chem Ind
01-21-81	22685	EP	Vectors for transfer of genes in eukaryotic cells	Inst Pasteur
12-30-80	885196	BE	DNA transfer vectors containing codes for human Insulin precursors	University of California
11-18-80	148083	JA	Mutant strain comprising microorganism of genus Nocardi	Mitsubishi Chem Ind
12-28-80	884012	BE	Cloning vector containing semi-synthetic gene	Genentech Inc

*KEY TO ABBREVIATIONS

BE	Belgium	FR	France	NL	Netherlands
DE	Federal Republic of Germany	GB	Great Britain	SU	Soviet Union
EP	European Patent	JA	Japan	WO	Published International Application (Patent Cooperation Treaty)

ENZYMES PER SE

This profile includes enzymes per se, enzyme compositions, and processes for preparing them. It also includes processes for separating enzymes from a source material, purifying enzymes, and treating enzymes to enhance or inhibit their activity. Enzymes are defined as proteinaceous materials which promote a chemical change in a starting material without being consumed in the reaction.

INCLUDED IN THIS PROFILE ARE ALL OF THE PATENTS FROM:

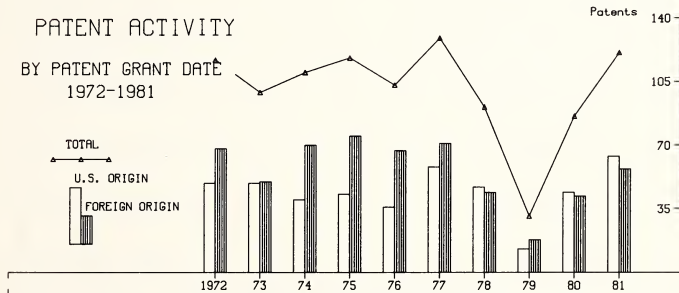
Class 435, Subclasses 183-234

ACTIVITY INDICES (1979-1981)

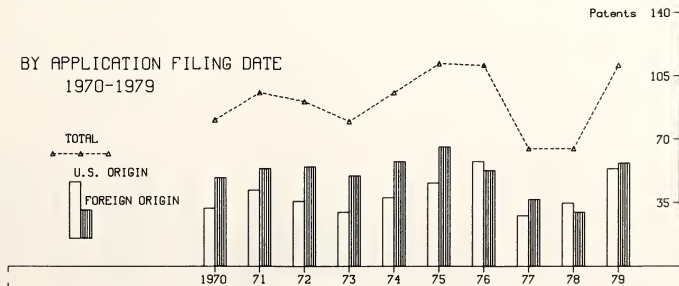
GROWTH	23.7%
FOREIGN SHARE	49.2%
CORPORATE OWNED	90.3%
GOVERNMENT OWNED	1.3%
U.S. OWNED OF FOREIGN	11.1%

PATENT ACTIVITY

BY PATENT GRANT DATE
1972-1981



BY APPLICATION FILING DATE
1970-1979



ENZYMES PER SE — PART 2A

PATENT ACTIVITY (1/63-12/81) BY DATE OF PATENT GRANT

		NUMBER OF PATENTS														PAGE A	
		63-67	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	TOTAL
TOTAL		208	30	48	40	87	117	99	110	118	103	129	91	31	86	121	1418
U.S. ORIGIN		131	18	37	20	48	49	49	40	43	36	58	47	13	44	64	697
FOREIGN ORIGIN		77	12	11	20	39	68	50	70	75	67	71	44	18	42	57	721
JAPAN		29	6	6	7	16	35	33	37	33	30	23	16	8	23	27	329
WEST GERMANY		10	2	5	10	12	18	3	7	12	10	10	7	4	6	7	105
NETHERLANDS		16	1	1	1	2	3	4	4	11	8	18	2	2	5	2	48
FRANCE		6	2	2	2	2	2	4	4	4	8	3	2	2	2	2	26
DENMARK		4					3	1	2	1	5	3	2				23
ITALY		2		1	1	1	3	2	1	1	2	3	3	1	1	5	23
NETHERLANDS		4				2	1	1	6	1	1	2	1	1	2	3	21
SWITZERLAND		4	1	1	3	1	2	1	3	1	1	2	4	2	1	1	19
CANADA		3								3	2	2	1				18
SWEDEN		4		1	1	1	2	1	2						2	1	14
BELGIUM						3	1	1		1	1	1	1		1		10
U.S.S.R.				1					1				3		1	2	7
AFRICA												2	1				4
AUSTRALIA		1				1				1	1	1					3
AUSTRIA										1	1	1					3
MEXICO										1							2
SPAIN		1								1	1	1					3
FINLAND															1		2
ISRAEL						1									1	1	2
CZECHOSLOVAKIA											1						1
NEW ZEALAND		1															1
ROMANIA																	1
IRAN									1								1
IRELAND							1										1
HUNGARY										1							1
HONG KONG						1											1
CHINA (MAINLAND)							1										1
U.S. ORIGIN		131	18	37	20	48	49	49	40	43	36	58	47	13	44	64	697
U.S. CORP. OWNED		111	14	30	19	43	44	39	35	34	32	54	42	11	40	54	602
U.S. GOVT. OWNED		2	3			2	1	5	4	1	1	3	1				26
U.S. INDIV. OWNED		17	1	5	1	3	4	4	4	5	3	3	2	1	4	8	63
FOREIGN OWNED		1							1	1							6
FOREIGN ORIGIN		77	12	11	20	39	68	50	70	75	67	71	44	18	42	57	721
U.S. OWNED		4		1	2	8	3	6	5	6	5	5	4	2	4	7	45
FOREIGN OWNED		73	12	10	18	31	60	47	64	70	61	66	40	16	38	50	666
FOREIGN CORP.		63	11	10	14	30	50	45	60	66	51	56	36	15	35	46	588
FOREIGN GOVT.										2	2						4
FOREIGN INDIV.		10	1		4	1	10	2	4	2	9	10	4	1	3	3	64

PATENT ACTIVITY (PATENTS GRANTED 1/67-12/81) BY DATE OF PATENT APPLICATION

PAGE A

		NUMBER OF PATENTED APPLICATIONS																
		PRE 68	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	TOTAL	
TOTAL		175	70	92	81	96	91	80	96	112	111	65	65	111	16		1261	
U.S. ORIGIN		110	37	43	32	42	36	30	38	46	58	28	35	54	10		599	
FOREIGN ORIGIN		65	33	49	49	54	55	50	58	66	53	37	30	57	6		662	
JAPAN		23	10	30	26	34	26	19	28	24	19	14	16	30	4		303	
WEST GERMANY		12	11	5	9	2	6	8	11	8	7	9	3	6	2		99	
UNITED KINGDOM		6	1	5	4	3	3	7	5	15	4	5	2	6			69	
FRANCE		4	2	1	3	5	5	5	4	8	4	1	1	1			31	
DENMARK		6	1	3			2	1	1	1	4	1	1	2			25	
ITALY		1	1		2	1	4	1	2	3	4	1	5	1			21	
NETHERLANDS		1	2	1	4	3	1	1	1	1	1	2	1	4			20	
SWITZERLAND		4				1	3	2	2	1	4	2	1	1			17	
CANADA		3	1	3	2	2	1	1	1	4	4		1	2			15	
SWEDEN		2	1	2	1		1	1	1	1	1	1	1	2			11	
BELGIUM		1	2	2													10	
U.S.S.R.														2			7	
S. AFRICA																	4	
AUSTRALIA		1						1	1	1	1	1					3	
AUSTRIA								1	1	1							3	
MEXICO		1						1		1							2	
SPAIN										1				1			2	
FINLAND																	1	
ISRAEL		1												1			2	
CZECHOSLOVAKIA																	1	
NEW ZEALAND							1				1			1			2	
ROMANIA																	1	
IRAN																	1	
IRELAND																	1	
HUNGARY					1		1										1	
HONG KONG				1													1	
CHINA (MAINLAND)					1												1	
U.S. ORIGIN		110	37	43	32	42	36	30	38	46	58	28	35	54	10		599	
U.S. CORP. OWNED		94	33	39	26	34	32	26	30	43	55	20	30	49	9		520	
U.S. GOVT. OWNED		6	2	2	4	4	4	1	4	1	1	2	1	1	1		25	
U.S. INDIV. OWNED		7	2	2	5	3	4	3	4	2	2	5	4	5			48	
FOREIGN OWNED		3			1	1						1					6	
FOREIGN ORIGIN		65	33	49	49	54	55	50	58	66	53	37	30	57	6		662	
U.S. OWNED		3	7	5	5	7	5	4	4	5	3	4	10	10			62	
FOREIGN OWNED		62	26	44	44	47	50	46	54	61	50	33	30	47	6		600	
FOREIGN CORP. OWNED		56	23	40	38	45	49	41	47	47	47	31	28	42	6		540	
FOREIGN INDIV. OWNED																	4	
FOREIGN INDIV.		6	3	4	6	2	1	4	6	13	3	2	2	4			56	

ENZYMES PER SE

Organizational Patenting: Ranked

NO. OF
PATENTS

ASSIGNEES WITH 6 OR MORE PATENTS (1969-1981)

40	SYVA CO.
34	CPC INTERNATIONAL INC.
32	MILES LABORATORIES INC.
27	KYOWA HAKKO KOGYO CO. LTD.
26	HAYASHIBARA CO.
26	BOEHRINGER MANNHEIM G.M.B.H.
23	BAYER AKTIENGESSELLSCHAFT
22	EASTMAN KODAK CO.
21	AJINOMOTO COMPANY INC.
18	STANDARD BRANDS INC.
18	PROCTER & GAMBLE CO.
17	MONSANTO CO.
16	A.E. STALEY MANUFACTURING CO.
15	TOYO JOZO CO., LTD.
15	BAXTER TRAVENOL LABORATORIES, INC.
14	TAKEDA CHEMICAL INDUSTRIES, LTD.
14*	AGENCE NATIONALE DE VALORISATION DE LA RECHERCHE (ANVAR)
13	KIKKOMAN SHOYU CO., LTD.
13	E.R. SQUIBB & SONS, INC.
10	GLAXO LABORATORIES LTD.
10	NOVO INDUSTRI A/S
10	IMPERIAL CHEMICAL INDUSTRIES LTD.
10	MERCK & CO. INC.
9	PABST BREWING CO.
9	RESEARCH CORP.
9	RIKAGAKU, KENKYUSHO
8	TANABE SEIYAKU CO. LTD.
8	SNAM PROGETTI S.P.A.
8	ABBOTT LABORATORIES
8	UNITED STATES OF AMERICA, AGRICULTURE
8	LEVER BROTHERS CO.
8	BEHRINGWERKE AKTIENGESSELLSCHAFT
8	UPJOHN CO.
8*	NOVO TERAPEUTISK LABORATORIUM A/S
7	R.J. REYNOLDS TOBACCO CO.
7	COLGATE-PALMOLIVE CO.
7	AKZONA INC.
7	GREEN CROSS CORP.
7*	HAYASHIBARA BIOCHEMICAL LABORATORIES INC.
6	✓ UNIVERSITY OF ILLINOIS FOUNDATION
6	EXXON RESEARCH & ENGINEERING CO.
6	HOKKAIDO SUGAR CO., LTD.
6*	MEIJI SEIKA KAISHA LTD.
6*	AMANO PHARMACEUTICAL CO., LTD.

*Composite Total. See Appendix A.

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

ABBOTT LABORATORIES

- 3790447 - STREPTOCOCCI DIAGNOSTIC METHOD
- 3865692 - METHOD FOR MAKING HIGHLY POTENT PLASMINOGEN
- 3930944 - UROKINASE PRODUCTION
- 3930945 - UROKINASE PRODUCTION
- 3937982 - PURIFICATION OF UROKINASE
- 4224408 - OXYTRIBONUCLEIC ACID SYNTHESIS USING BINDING PROTEIN
- 4252696 - METHOD OF STABILIZING ENZYME IN A SERUM PROTEIN-BASED MEDIUM
- 4273866 - LIQAND ANALOG-IRREVERSIBLE ENZYME INHIBITOR CONJUGATES AND METHODS FOR USE

ADVANCE BIOFACTURES CORPORATION

- 3821364 - PROCESS OF PRODUCING COLLAGENASE

A. E. STALEY MANUFACTURING COMPANY

- 3522602 - PROCESS FOR REDUCING VISCOSITY OF STABILIZED STARCH SOLUTIONS
- 3556942 - METHOD FOR OBTAINING AMYLOSE FROM COOKED STARCH SOLUTIONS
- 3616219 - PROCESS FOR IMPROVED ENZYME CONVERTIBILITY OF STARCH
- 3630844 - STARCH CONVERSION SYRUPS
- 3634087 - METHOD OF PRODUCING AMYLO-1,6-GLUCOSIDASE
- 3634088 - METHOD OF PRODUCING AMYLO-1,6-GLUCOSIDASE
- 3720583 - ENZYME HYDROLYSIS
- 3761420 - STABILIZED LIQUID ENZYME STAIN REMOVER
- 3783100 - NON-RETROGRADED THINNED HYDROLYZATES
- 3806415 - THINNING AND SACCHARIFICATION OF STARCH PASTES WITH GLUCOAMYLASE
- 3897305 - PROCESS FOR PRODUCING DEXTROSE
- 3956066 - GLUCOSE ISOMERIZING ENZYME
- 3963575 - PRODUCING PULLULANASE WITH ORGANISMS HAVING A SUPERIOR CAPACITY TO ELABORATE PULLULANASE
- 4026764 - DRY ISOMERASE ACTIVATION
- 4113965 - GLUCOSE ISOMERIZATION WITH IRON ION-THIOL ACTIVATOR ION-GLUCOSE ISOMERASE SYSTEMS

AGENCE NATIONALE DE VALORISATION DE LA RECHERCHE (ANVAR)

- 3647620 - METHOD OF PRODUCING ENZYME FROM GLUCOSE SYRUPS TO FRUCTOSE
- 3647625 - METHOD OF REDUCING RAFFINOSE CONTENT OF BEET MOLASSES
- 3669362 - ENZYMIC METHOD FOR MANUFACTURE OF FRUCTOSE
- 3767826 - METHOD FOR INCREASING YIELD OF SUCROSE
- 3795585 - METHOD FOR MANUFACTURE OF ALPHA-GALACTOSIDASE
- 3832284 - METHOD FOR MANUFACTURE OF ALPHA-GALACTOSIDASE BY MICROORGANISMS
- 3833474 - ASPOREGENIC PROTEASE-PRODUCING STRAINS OF BACILLUS SUBTILIS
- 3920521 - SUPEROXIDE DISMUTASES AND THEIR APPLICATIONS AS OXIDATION INHIBITORS
- 3930028 - PROCESS FOR THE MICROBIOLOGICAL PURIFICATION OF DAIRY EFFLUENTS
- 3981773 - PROCESS FOR THE PREPARATION OF GALACTOSE AND BEVERAGES BASED ON GALACTOSE FROM SOLUTIONS CONTAINING LACTOSE
- 3982661 - METHOD FOR MANUFACTURE OF MALTOSE FROM STARCH BY ENZYMES CO-PRODUCED BY A SINGLE MICROORGANISM
- 3997402 - SUPEROXIDE DISMUTASE AND PROCESS FOR PRODUCTION
- 4013572 - METHOD FOR ADSORPTION AND ELUTION OF LIPID HYDROLYZING ENZYMES

AGRICULTURAL BIOLICALS CORPORATION

- 3705083 - PROCESS FOR PRODUCING COLLAGENASE

AJINOMOTO COMPANY INCORPORATED

- 3616234 - METHOD OF PREPARING PROTEASE FROM CANOIDA LIPOLYTICA
- 3622459 - METHOD OF PREPARING A PROTEOLYTIC ENZYME BY FERMENTATION
- 3677898 - ACID PROTEASE AND METHOD OF PREPARING THE SAME
- 3707505 - ENZYME-CONTAINING DETERGENT COMPOSITION
- 3715279 - RECOVERY OF PROTEASE VALUES FROM FERMENTATION BROTHS
- 3767532 - METHOD OF PRODUCING PROTEASE BY MICROORGANISM

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

AJINOMOTO COMPANY INCORPORATED

(CONTINUED)

- 3791924 - BIOLOGICAL METHOD OF PRODUCING PHENOLIC AMINO ACIDS
- 3803101 - BIOLOGICAL METHOD OF PRODUCING TRYPTOPHAN AND 5-SUBSTITUTED TRYPTOPHANS
- 3803102 - BIOLOGICAL METHOD OF PRODUCING ELONGATED CHAIN BACTERIAL
- 3871963 - MICROBIAL PROTEASE AND PREPARATION THEREOF
- 3930948 - ENZYMIC METHOD FOR PRODUCING AROMATIC ETHYLAMINES
- 3950223 - STABILIZING AND ENHANCING UROKINASE ACTIVITY
- 3957581 - METHOD OF PRODUCING PEPTIDASE
- 3960661 - METHOD FOR PRODUCING INSOLUBLE BY FERMENTATION
- 4010258 - MICROBIAL AMYLASE INHIBITOR AND PREPARATION THEREOF WITH THE USE OF STREPTOMYCES DIASTICUS VAR. AMYLOSTATICUS
- 4022666 - ALPHA-AMYLASES FROM <1 BACILLUS SUBTILIS
- 4071405 - METHOD OF PRODUCING SULFUR CONTAINING L-AMINO ACIDS
- 4108989 - THERMOSTABLE CELLULASE AND A METHOD FOR PRODUCING THE SAME
- 4109020 - THERMOSTABLE AMYLASE AND A METHOD FOR PRODUCING THE SAME
- 4169200 - PROCESS FOR PRODUCTION OF UROKINASE
- 4228241 - METHOD FOR PRODUCING A PEPTIDASE

AKTIEBOLAGET ASTRA

- 3509024 - ASPERGILLOPEPTIDASE FOR USE IN THERAPY AND A PROCESS FOR THE PREPARATION THEREOF
- 3622462 - PROCESS FOR MANUFACTURE OF AN ENZYME PREPARATION

AKZINA INCORPORATED

- 3791932 - PROCESS FOR THE DEMONSTRATION AND DETERMINATION OF REACTION COMPONENTS HAVING SPECIFIC BINDING AFFINITY FOR EACH OTHER
- 3839153 - PROCESS FOR THE DETECTION AND DETERMINATION OF SPECIFIC BINDING PROTEINS AND THEIR CORRESPONDING BINDABLE SUBSTANCES
- 3850752 - PROCESS FOR THE DEMONSTRATION AND DETERMINATION OF LOW MOLECULAR COMPOUNDS AND OF PROTEINS CAPABLE OF BINDING THESE COMPOUNDS
- 3879262 - DETECTION AND DETERMINATION OF HAPTENS
- 4169012 - STABILIZED PEROXIDASE REAGENT FOR ENZYME IMMUNODASSAY
- 4228240 - STABILIZATION OF PEROXIDASE
- 4292403 - DETECTION AND/OR DETERMINATION OF IGM, IGA, IGG AND IGE IMMUNOGLOBULINS

ALFA FARMACEUTICI S.P.A.

- 3766009 - PROCEDURE FOR ENZYMIC PRODUCTION OF SEMI-SYNTHETIC PENICILLINS

ALPHA PATENT LIMITED

- 4259447 - PROCESS FOR THE PRODUCTION OF UROKINASE IN PURE CONDITION

ALZA CORPORATION

- 3875013 - ARTICLE FOR DETECTING THE FERTILE PERIOD AND METHOD FOR USING SAME
- 3968011 - TEST IMPLEMENT AND TEST METHOD FOR COLDIMETRICALLY DETERMINING WHETHER A FEMALE IS FERTILE OR PREGNANT

AMAND PHARMACEUTICAL CO., LTD.

- 3875007 - LIPID METABOLISM IMPROVING AND ANTI-ATHEROMATIC AGENT
- 3983002 - PROCESS FOR PREPARATION OF CELLULASE
- 4228538 - PROCESS FOR PREPARING ACYL-CoA SYNTHETASE LCF-18
- 4269942 - PROCESS FOR PREPARING ACYL-CoA SYNTHETASE LCF-18

AMANO SEIYAKU KABUSHIKI KAISHA

- 3431175 - METHOD FOR THE PREPARATION OF A LIPIDPROTEIN LIPASE BY CULTIVATING ORGANISMS
- 3728223 - PRODUCTION OF HYALURONIDASE FROM A STRAIN OF STREPTOMYCES

AMERICAN CYANAMID COMPANY

- 3434929 - PROCESS FOR PURIFYING PLASMIN
- 3444045 - PROCESS FOR PURIFYING STREPTOKINASE
- 3809617 - DEVICE FOR DETECTING ANTICOLINESTERASE MATERIALS

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

AMERICAN HOME PRODUCTS CORPORATION

3455784 - CONTROL OF ENZYME ACTIVITY IN FROZEN SYSTEMS

AMERICAN SUPPLY CORPORATION

3898130 - RAPID ENZYMIC HYDROLYSIS OF TRIGLYCERIDES
4223090 - REAGENTS FOR THE ENZYMIC DETERMINATION OF TRIGLYCERIDES

A. NATTERMANN CIE GMBH

3925158 - PROCESS OF MANUFACTURING ENZYME PREPARATION RICH IN LIPASE
4088539 - PROCESS OF MANUFACTURING ENZYME PREPARATION RICH IN LIPASE

ANHEUSER-BUSCH, INCORPORATED

3813320 - METHODS OF MAKING GLUCOSE ISOMERASE AND OF CONVERTING GLUCOSE TO FRUCTOSE
3992262 - MEDIA CONTAINING MOLASSES AND CORN STEEP LIQUOR FOR PRODUCING GLUCOSE ISOMERASE FROM ACTINOPLANES AND METHOD
4003793 - MEDIA CONTAINING MOLASSES AND SOY FLOUR FOR PRODUCING GLUCOSE ISOMERASE AND METHOD
4035235 - METHOD OF MAKING LIPOPHILIC STARCH DERIVATIVES

ARMOUR PHARMACEUTICAL COMPANY

3986927 - PROCESS FOR THE PURIFICATION AND STERILIZATION OF ACIDOPHILIC BIOLOGICALS BY EXTREME ACIDIFICATION AT COLO TEMPERATURES

ASAHI BEVERIES LTD.

3472737 - METHOD OF MAKING CEREAL MALT

ASAHI KASEI KOGYO KABUSHIKI KAISHA

4028187 - METHOD OF OBTAINING UROKINASE

A/S ORTHIANA KEMISK FABRIK

4254535 - METHOD AND AN APPARATUS FOR MAKING BASIC MATERIAL FOR THE PRODUCTION OF A BIOLOGICALLY ACTIVE PREPARATION

ASTRA LAKEMEDEL AKTIEBOLAG

3684658 - ENZYMES AND PROCESS FOR THEIR PREPARATION
3838008 - STEREOSSELECTIVE PREPARATION OF L-OPA AND L-M-TYROSINE AND NOVEL COMPOUNDS
3849552 - PROTEASE INHIBITORS AND METHOD FOR PREPARATION

AYERST, MCKENNA + HARRISON LTD

3912704 - PROTEASE INHIBITOR FROM HORSE URINE

BASF AKTIENGESSELLSCHAFT

4235973 - MACROPOROUS POLYMERIC CARRIER FOR COVALENTLY BINDING PROTEINS. ITS PREPARATION AND ITS USE FOR FIXING ACTIVE PROTEINS
4266030 - MACROPOROUS POLYMERIC CARRIER FOR COVALENTLY BINDING PROTEINS. ITS PREPARATION AND ITS USE FOR FIXING ACTIVE PROTEINS

BATTELLE MEMORIAL INSTITUTE

4066505 - PROCESS FOR EXTRACTING A POLYPEPTIDE FROM AN AQUEOUS SOLUTION

BAXTER TRAVENOL LABORATORIES, INC.

3598433 - PROCESS FOR PURIFICATION OF CHYMOPAPAIN
3620423 - LONG-STERILE FORM OF CHYMOTRYPSIN
3620423 - PRODUCTION OF ACTIVE CHYMOTRYPSIN
3623957 - PREPARATION OF MICROBIAL ALKALINE PROTEASE BY FERMENTATION WITH BACILLUS SUBTILIS, VARIETY LICHENIFORMIS
3627643 - HIGH STRENGTH DEXTROSE AND PROCESS OF PREPARATION
3629073 - ACID-ACTIVE LACTOSE
3684710 - MANNAN DEPOLYMERASE ENZYME COMBINATION
3708397 - SYRUP CONVERSION WITH IMMOBILIZED GLUCOSE ISOMERASE
3763010 - STABILIZED MICROBIAL RENNET
3850065 - PRODUCTION OF STREPTOKINASE
3899395 - LIPOLYTIC ENZYME RECOVERY METHOD

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

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BAXTER TRAVENOL LABORATORIES, INC.

- 3966543 - ENZYME-TREATED PAPER
- 4104030 - PHOTOMETRIC DETERMINATION OF PROTEIN, AND OF ENOTOXIN WITH LIMULUS PROTEIN
- 4267272 - PROSTATIC ACID PHOSPHATASE IMMUNO ASSAY
- 4286056 - METHOD FOR MAKING THERAPEUTIC ENZYME COMPOSITIONS

BAYER AKTIENGESELLSCHAFT

- 3555000 - PLASMINOGEN ACTIVATOR AND ISOLATION THEREOF FROM STROMATA OF HUMAN ERYTHROCYTES
- 3555001 - METHOD FOR THE ENRICHMENT OF L-ASPARAGINASE
- 3622028 - PROCESS FOR THE ENRICHMENT OF L-ASPARAGINASE
- 3622461 - PROCESS FOR THE EXTRACTION OF L-ASPARAGINASE
- 3625829 - PURIFICATION OF CARBOXYPEPTIDASE B
- 3634196 - PROCESS FOR THE SEPARATION OF PYROGENS FROM CRUDE PREPARATIONS OF L-ASPARAGINASE
- 3650902 - PROCESS FOR THE STABILIZATION AND PURIFICATION OF L-ASPARAGINASE
- 3660237 - PROCESS FOR OBTAINING KALLIKREIN FROM PANCREAS OR SUBMANDIBULAR GLANDS OF PIGS
- 3660239 - FIBRINOLYSOKINASES FROM STREPTOMYCES
- 3773624 - PROCESS FOR THE ENRICHMENT OF L-ASPARAGINASE
- 3834990 - ISOLATION OF ENZYMES AND ENZYME INHIBITORS
- 3834991 - WATER-SOLUBLE ENZYME INHIBITORS
- 3871982 - WATER-INSOLUBLE PEPTIDE MATERIALS
- 3876766 - GLYCOSIDE-HYDROLASE ENZYME INHIBITORS
- 3879546 - SACCHARASE INHIBITORS
- 3887434 - MICROBIOLOGICAL PRODUCTION OF INVERTASE
- 3905870 - PURIFICATION OF KALLIKREIN
- 3926730 - SEPARATION AND PURIFICATION OF ALPHA-AMYLASE
- 3930949 - PROCESS FOR THE PRODUCTION OF 7-AMINO-DELTA\3/ -CEPHEM DERIVATIVES
- 3951745 - GLYCOSIDE-HYDROLASE ENZYME INHIBITORS
- 4013510 - GLYCOSIDE-HYDROLASE ENZYME INHIBITORS
- 4019960 - PROCESS FOR THE PRODUCTION OF A SACCHARASE INHIBITOR
- 4144128 - POLYMERIC CARRIER BOUND LIGANDS

BECKMAN INSTRUMENTS INC.

- 3787289 - METHOD OF PRODUCING DEXTRANASE
- 4036697 - KINETIC ASSAY FOR ALPHA-AMYLASE
- 4097336 - REAGENT SYSTEM FOR BETA-AMYLASE ASSAY
- 4218535 - DETERMINATION OF ENZYME SUBSTRATE CONCENTRATION

BECTON, DICKINSON AND COMPANY

- 4038147 - METHOD FOR DETECTING ENOTOXINS

BEECHAM GROUP LIMITED

- 3919415 - SUBSTANCE MM 4550 AND PROCESS FOR PRODUCING SAME
- 4113856 - ANTIBIOTIC MM 13902
- 4230804 - WATER-INSOLUBLE PENICILLIN ACYLASE PREPARATION
- 4267273 - ENZYME PREPARATION HAVING AFFINITY FOR WATER-IMMISCIBLE LIQUIDS
- 4285932 - ENZYME DERIVATIVES FOR USE IN THE TREATMENT OF VENOUS THROMBOSIS

BEHRINGERWERKE AKTIENGESELLSCHAFT

- 3732146 - PROCESS FOR THE ISOLATION OF NATIVE, HIGHLY PURIFIED PLASMINOGEN
- 3920950 - DERIVATIVE OF ALPHA-1 FETOSPECIFIC SERUM PROTEIN AND PROCESS FOR ITS MANUFACTURE
- 3920951 - DERIVATIVE OF ALPHA-1 FETOSPECIFIC SERUM PROTEIN AND PROCESS FOR ITS MANUFACTURE
- 3983004 - PREPARATION OF A DIAGNOSTIC TOXIN FOR MEASURING THE COAGULABILITY OF BLOOD
- 4007265 - METHOD FOR TREATING TETANUS TOXIN WITH A PROTEINASE TO PRODUCE AN ATOXIC IMMUNOGENIC PRODUCT
- 4011142 - PROCESS FOR MEASURING THE PLASMINOGEN CONTENT OF A SAMPLE
- 4217339 - GLYCOPROTEIN AND PROCESS FOR ISOLATING IT
- 4308204 - PROCESS FOR PREPARING THE THIRD COMPONENT OF THE COMPLEMENT FROM HUMAN BLOOD PLASMA

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

- BERNARD WOLNAK AND ASSOCIATES, INC.
4259443 - SYNTHESIS OF ASCORBIC ACID FROM LACTOSE
- BIOCHEMIE GESELLSCHAFT M.B.H.
3737375 - PROCESS FOR THE PRODUCTION OF 6-AMINOPENICILLONIC ACID
- BIODATA S.P.A.
4279999 - MEANS FOR ACCELERATING PRECIPITATION IN IMMUNODASSAY AND IMMUNODASSAY METHOD
- BIORESEARCH LIMITED
3954726 - DOUBLE SALTS OF S-ADENOSYL-L-METHIONINE
4028183 - PROCESS OF PREPARING DOUBLE SALTS OF S-ADENOSYL-L-METHIONINE
- BIOREX LABORATORIES LIMITED
4152212 - PROCESS FOR THE PURIFICATION OF GLUCURONIDGLYCOSAMINDGLYCAN HYALURONATE LVASE
- BJORKSTEN, UDHAN
3775254 - PURIFICATION OF LOW MOLECULAR WEIGHT ENZYMES
- BOARD OF REGENTS FOR EDUCATION OF THE STATE OF RHODE ISLAND
4105800 - IMMOBILIZED ENZYME METHOD TO ASSESS FISH QUALITY
- BOARD OF TRUSTEES OF THE LELAND STANFORD UNIVERSITY
3637808 - SYNTHETIC POLYNUCLEOTIDES
- BOEHRINGER MANNHEIM G.M.B.H.
3509025 - METHOD AND AGENT FOR THE ENZYMATIC DETERMINATION OF GLUCOSE
3616231 - PROCESS FOR THE PRODUCTION OF URICASE
3639211 - PROCESS FOR THE PREPARATION OF CREATINE PHOSPHATE
3645851 - RECOVERY OF GLUCOSE OXIDASE
3677901 - PROCESS FOR THE PRODUCTION OF GLYCEROKINASE
3759793 - PROCESS FOR THE QUANTITATIVE DETERMINATION OF TRI- DI- AND MONOGLYCERIDES
3759793 - PROCESS FOR THE ENRICHMENT OF PROTEINS USING POLYETHYLENE-IMINE
3806416 - CREATINE AMIDOHYDROLASE AND PROCESS FOR ITS PREPARATION
3806420 - PROCESS FOR THE ENRICHMENT OF PROTEINS USING POLYETHYLENE-IMINE
3806420 - CREATINE AMIDOHYDROLASE COMPOSITION AND PROCESS FOR THE DETERMINATION OF CREATININE
3912588 - CREATINE AMIDOHYDROLASE IN THE CONVERSION OF CREATININE TO CREATINE
3925164 - METHOD FOR THE DETERMINATION OF CHOLESTEROL
3947377 - STABILIZED INDICATOR COMPOSITIONS CONTAINING 9-GAMMA-AMINOPROPYL-3-AMINOCARBAZOLE
3948728 - STERIOD-DELTA-ISOMERASE
3951744 - PURIFICATION OF DEHYDROGENASES
4008127 - PROCESS FOR THE PREPARATION OF CHOLESTEROL OXIDASE
4065508 - PROCESS AND REAGENT FOR DETERMINING TRIGLYCERIDES
4080262 - STABILIZING AGENT FOR ENZYMES
4118279 - STABILIZING AGENT FOR ENZYMES
4123384 - CONTROL SERUM CONTAINING ALKALINE PHOSPHATASE OF CONSTANT ACTIVITY
4123384 - CONTROL SERUM CONTAINING ALKALINE PHOSPHATASE OF CONSTANT ACTIVITY
4186052 - NADPH-OXIDASE FOR HYDROGEN PEROXIDE DETERMINATION
4188465 - STABILIZED UREASE COMPOSITION
4237221 - PROCESS FOR OBTAINING MALTOSE PHOSPHORYLASE AND +62 - PHOSPHOGLUCIDOMUTASE AND METHOD OF DETERMINING +60 -AMYLASE USING SAM
- BREWING PATENTS LIMITED
3896001 - MALTING PROCESSES

ENZYMES PER SE

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

BRISTOL-MYERS COMPANY

4053360 -

BURROUGHS WELLCOME CO.

3943451 - MICROORGANISM PRODUCTION

4097337 - BACTERIAL CULTURE MEDIUM

4219621 - STABILIZED THYMIDINE PHOSPHORYLASE PREPARATION AND CULTURE MEDIUM

4298685 - DIAGNOSTIC REAGENT

CALBIOCHEM-BEHRING CORP.

4228237 - METHODS FOR THE DETECTION AND DETERMINATION OF LIGANDS

4234680 - METHOD FOR TERMINATING A PEROXIDASE CATALYZED REACTION

CALBIOCHEM

3539450 - STABILIZATION OF ENZYMES

3703591 - TRIGLYCERIDE HYDROLYSIS AND ASSAY

3994783 - DIFFERENTIAL ASSAY OF CREATINE PHOSPHOKINASE ISOENZYMES

CALIFORNIA INSTITUTE OF TECHNOLOGY

4013507 - IONENE POLYMERS FOR SELECTIVELY INHIBITING THE VITRO GROWTH OF MALIGNANT CELLS

CANADA PACKERS LIMITED

3679548 - PROCESS FOR THE ENZYMIC UNHAIRING OF HIDES

4065355 - PURIFICATION OF DEOXYRIBONUCLEASE

CANADIAN PATENTS AND DEVELOPMENT LIMITED

3515641 - PROTEOLYTIC ENZYMES

3734831 - PRODUCTION OF CELLULOSE

3852007 - EXTRACTION OF CHITINASE

3904481 - DETERMINATION OF NITROGENASE

4066753 - NEOMYCIN AND PAROMOMYCIN DERIVATIVES

CASE WESTERN RESERVE UNIVERSITY

3581983 - RAPID, RADIOCHEMICAL-LIGAND BINDING ASSAY FOR METHOTREXATE

CASTLE & COOKE INC.

3475277 - ION EXCHANGE TREATMENT OF BROMELAIN

3539451 - PRODUCTION OF REVERSIBLY INACTIVATED PAPAIN AND FIGIN

3658651 - ION EXCHANGE TREATMENT OF BROMELAIN

CENTER FOR BLOOD RESEARCH, INC.

4303592 - AMINO(1-PHENYL)METHYLSULFONYLFLUORIDE

CENTURY LABORATORIES INC.

3477910 - METHOD OF PRODUCTION OF UROKINASE

3477911 - METHOD OF PRODUCTION OF UROKINASE

3477912 - METHOD OF PRODUCTION OF UROKINASE

3477913 - METHOD OF PRODUCTION OF UROKINASE

3544427 - METHOD OF PRODUCTION OF UROKINASE

CESKOSLOVENSKA AKADEMIE VED

3983001 - ISOLATION OF BIOLOGICALLY ACTIVE COMPOUNDS BY AFFINITY CHROMATOGRAPHY

CETUS CORPORATION

4247641 - METHOD FOR PRODUCING EPOXIDES AND GLYCOLS FROM ALKENES

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

- CHEMRO HOLDINGS (PROPRIETARY) LIMITED
4059490 - MEASUREMENT OF ALKALINE PHOSPHATASE LEVELS IN BODY FLUIDS
- CHILDREN S HOSPITAL MEDICAL CENTER
4040808 - POLAROGRAPHIC ANALYSIS OF CHOLESTEROL AND OTHER MACROMOLECULAR SUBSTANCES
- CHINJIN GYOGYSZER ES VEGYESZEI TERMEKEK GYARA RT.
3875003 - PROCESS FOR THE PREPARATION OF PROSTAGLANDIN
- CHIVODA CHEMICAL ENGINEERING & CONSTRUCTION CO., LTD.
4275162 - PROCESS FOR THE PRODUCTION OF SPHINGOMYELINASE
- CHOAY S.A.
3796631 - PROCESSES FOR PREPARING POLYNUCLEOTIDES
3886043 - PROCESS FOR PREPARING PURE PORCINE BETA-TRYPSIN
3926727 - UROKINASE PREPARATIONS
4028992 - METHOD FOR THE PREPARATION OF STABLE UROKINASE-HEPARIN COMPLEXES AND METHODS FOR USE THEREOF
4106992 - PURIFICATION OF UROKINASE
- CHUGAI SEIYAKU KABUSHIKI KAISHA
3958650 - CELL-WALL LYTIC ENZYME AND PROCESS FOR THE PRODUCTION THEREOF
3786141 - METHOD OF THE PRODUCTION OF ANTI-TUMOR SUBSTANCES
4067963 - SUBSTANCE ACTING TO PREVENT AND IMPROVE CEREBRAL FUNCTION DISORDER AND PROCESS FOR PREPARING THE SAME
- CIBA-GEIGY CORPORATION
3844891 - FLOWABLE PANCREATIN PREPARATION OF LOW GERM CONTENT, AND A PROCESS FOR ITS MANUFACTURE
3923959 - PROCESS FOR PREPARING PLAIN ENZYME PREPARATIONS OF LOW GERM CONTENT
4124615 - PROCESS FOR THE MANUFACTURE OF 7-AMINO-2-HEPTACARBOXYLIC ACID-TYPE COMPOUNDS
4118515 - PREPARATION OF A STABILIZED PAINAIN SOLUTION
- CITY OF HOPE NATIONAL MEDICAL CENTER
3448009 - STABILIZATION OF ENZYMES
- COCA-COLA COMPANY
3736147 - PROCESS FOR PREPARING PROTEIN PRODUCTS
- COLGATE-PALMOLIVE COMPANY
3667853 - GRANULATION PROCESS
3770095 - METHOD FOR PREPARING ENZYMES
3773627 - PRODUCTION OF GRANULAR MIXTURES
3775331 - MANUFACTURE OF ENZYME SPHERES
4016040 - PREPARATION OF ENZYME-CONTAINING BEADS
4087368 - WATER-SOLUBLE ENZYME GRANULES
4115546 - ORAL COMPOSITIONS CONTAINING DEXTRANASE
- COLONIAL SUGAR REFINING COMPANY LIMITED
3607647 - TREATMENT OF SUGAR SOLUTIONS
3875009 - BIOLOGICAL PRODUCTS
- COMMERCIAL SOLVENTS CORPORATION
3696000 - PROCESS FOR THE PRODUCTION OF ALKALINE PROTEINASE
- CONOCO, INC.
3769167 - CONCURRENT PRODUCTION OF A PLURALITY OF ENZYMES
4019959 - BACTERIAL PRODUCTION OF LIPASE AND PYOCYANINE FROM N-PARAFFINS

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

CORNING GLASS WORKS

- 4087331 - METHOD OF MAKING FRUCTOSE WITH IMMOBILIZED GLUCOSE ISOMERASE
- 4002576 - ENZYME CARRIER REGENERATION
- 4282315 - PREPARATION OF ENRICHED WHOLE VIRUS RADIODILIGAND

CORN PRODUCTS COMPANY

- 3425910 - PRODUCTION OF CYCLODEXTRIN

COUTLER ELECTRONICS INC.

- 4087331 - COLDIMETRIC METHOD FOR DETERMINING GAMMA-GLUTAMYL TRANSPEPTIDASE AND COMPOSITIONS USEFUL THEREIN
- 4242446 - METHOD FOR DETERMINING A SUBSTANCE IN A BIOLOGICAL FLUID AND REAGENT COMBINATION FOR USE IN THE METHOD

CPC INTERNATIONAL INC.

- 3549496 - PROCESS FOR MAKING HIGH MALTOSE SYRUP
- 3565765 - PREPARATION OF HIGH MALTOSE CONVERSION PRODUCTS
- 3619396 - ENZYMATIC PRODUCTION OF GLUCONIC ACID
- 3622463 - PRODUCTION OF EXTRACELLULAR GLUCOSE ISOMERASE BY STREPTOMYCES
- 3640847 - PROCEDURE FOR PRODUCTION OF ALPHA-CYCLODEXTRIN
- 3663372 - METHOD OF PREPARING A DRIED GLUCAMYLASE PREPARATION
- 3681195 - METHOD OF TREATING YEAST
- 3770589 - PROCESS FOR THE PRODUCTION OF GLUCOSE ISOMERASE
- 3806419 - PREPARING PULLULANASE ENZYME
- 3825712 - PRODUCTION OF GLUCOSE ISOMERASE ENZYME PREPARATIONS
- 3825711 - THERMOPHILIC GLUCOSE ISOMERASE ENZYME PREPARATION
- 3849194 - LOW D.E. STARCH CONVERSION PRODUCTS
- 3860536 - ENZYME-DETERGENT COMBINATION
- 3910821 - ENZYMATIC ISOMERIZATION PRODUCT
- 3922196 - ENZYMATIC HYDROLYSIS OF GRANULAR STARCH
- 3922197 - PROCESS FOR CONVERTING GRANULAR STARCH TO DEXTROSE
- 3922198 - PROCESS FOR CONVERTING GRANULAR STARCH TO DEXTROSE
- 3922200 - ENZYMATIC HYDROLYSIS OF GRANULAR STARCH
- 3922201 - PREPARATION OF SWEET SYRUP FROM DEXTROSE
- 3935070 - HYDROLYSIS OF GRANULAR STARCH
- 3956065 - INERT, NON-POURUS GRANULES FOR FLOW CONTROL IN A PLUG FLOW REACTOR
- 3957587 - PRODUCTION OF XYLULOSE (DEXTROSE) ISOMERASE ENZYME PREPARATIONS
- 3960663 - PROCESS FOR THE CONTINUOUS ISOMERIZATION OF DEXTROSE
- 4040861 - PROCESS OF REFINING ENZYMATICALY PRODUCED LEVULOSE SYRUPS
- 4113509 - ENZYMATICALY PRODUCED MALTOSE-MALTOIDROSE STARCH HYDROLYSATE
- 4163013 - PROCESS FOR PREPARING GLUCAMYLASE
- 4202939 - GLUCAMYLASE IMMOBILIZED ON CATIONIC COLLOIDAL SILICA
- 4230570 - PROTEASE INACTIVATED +60 -AMYLASE PREPARATIONS
- 4247637 - HIGHLY THERMOSTABLE GLUCAMYLASE AND PROCESS FOR ITS PRODUCTION
- 4254225 - NOVEL NEUTRAL GLUCAMYLASE AND METHOD FOR ITS PRODUCTION
- 4276379 - PREPARATION OF HIGH FRUCTOSE SYRUPS FROM SUCROSE
- 4284722 - HEAT AND ACID-STABLE ALPHA-AMYLASE ENZYMES AND PROCESSES FOR PRODUCING THE SAME

CROWN ZELLERBACH CORPORATION

- 3558434 - STIMULATION OF THE GROWTH OF MICROORGANISMS

CUTLER LABORATORIES INC.

- 4229540 - HYDROLASE PURIFIED FROM HUMAN PLASMA

DAIINIPPON PHARMACEUTICAL CO. LTD.

- 3923600 - PURIFICATION OF MICROORGANISM CELLS LYTIC ENZYME

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING.

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DAINIPPON PHARMACEUTICAL CO. LTD.
3927200 - STABILIZATION OF MICROORGANISM CELLS LYTIC ENZYME
3929579 - DENTAL CARRIES-INDUCING MICROORGANISM CELLS LYTIC ENZYME
3986930 - LIPASE ACTIVITY DETERMINING METHOD AND REAGENT

DAIWA KASEI KABUSHIKI KAISHA
4237230 - NOVEL LACTASE

DAMF S LABORATORIES, INC.
3701715 - METHOD FOR THE PRODUCTION OF GLUCOSE OXIDASE

ODS KROYER A/S
3910820 - METHOD OF MAKING STARCH HYDROLYSATES BY ENZYMATIC HYDROLYSIS

DENKI KAGAKU KOGYO KABUSHIKI KAISHA
4205128 - PROCESS FOR PRODUCING IMMOBILIZED ENZYME COMPOSITIONS

DEUTSCHE GOLD- UND SILBER-SCHNEIDENSTALT VORMALS ROESSLER
3597319 - PROCESS FOR THE PRODUCTION OF HELLEBRGININ
3956491 - MEDICINE CONTAINING THE MAIN SAPOGENIN OF HELLEBORUS
4004976 - PROCESS FOR RECOVERING THE MAIN SAPOGENINS FROM THE ROOTS OF RHIZOMES OF HELLEBORUS

DIAGNOSTIC DATA, INC.
4070459 - N-CARBAWYLATED ORGOTEIN

DIRECTOR OF NATIONAL FOOD RESEARCH INSTITUTE
3868303 - METHOD OF PRODUCING ENZYME AND ITS UTILIZATION THEREOF

DOW CHEMICAL COMPANY
3776693 - DRY CLEANING COMPOSITION AND PROCESS
4056442 - LIPASE COMPOSITION FOR GLYCEROL ESTER DETERMINATION
4246350 - PROTEIN IMMOBILIZATION ON CHELATING RESINS
4279984 - LIPASE DETERMINATION METHOD AND REAGENT
4308349 - ISOMERIZATION OF GLUCOSE TO FRUCTOSE USING GLUCOSE ISOMERASE FROM AMPULLARIELLA

DYNASCIENCES CORPORATION
4301245 - CHROMOGENIC METHOD OF DETECTING ENDOOTOXINS IN BLOOD

EARLY WARNING COMPANY
3876504 - PROCEDURE FOR DETERMINATION OF ANTIGENS AND ANTIBODIES AND ARTICLES FOR USE THEREWITH

EASTMAN KODAK COMPANY
3515551 - PHOTOGRAPHIC PROCESSES AND ELEMENTS
3869349 - METHOD FOR THE ENZYMATIC HYDROLYSIS OF CHOLESTEROL ESTERS
3884764 - METHOD AND COMPOSITION FOR BLOOD SERUM CHOLESTEROL ANALYSIS
3909359 - METHOD FOR THE PREPARATION OF CHOLESTEROL OXIDASE
4035237 - METHOD FOR THE PREPARATION OF CHOLESTEROL OXIDASE
4052261 - METHOD FOR THE PREPARATION OF CHOLESTEROL OXIDASE
4055469 - PURIFICATION OF MICROBIAL ENZYME EXTRACTS USING SYNTHETIC POLYELECTROLYTES
4062731 - PRODUCTION OF URICASE FROM MICROCOCCUS LUTEUS
4064010 - PURIFICATION OF URICASE
4072568 - METHOD FOR THE PREPARATION OF CHOLESTEROL OXIDASE
4093517 - METHOD FOR PRODUCING CHOLESTEROL OXIDASE IN THE PRESENCE OF A NONIONIC SURFACTANT
4166005 - PROCESS FOR THE PRODUCTION OF +60 -GLYCEROPHOSPHATE OXIDASE
4166763 - ANALYSIS OF LACTIC ACID OR LACTATE USING LACTATE OXIDASE

ENZYMES PER SE

ORGANIZATIONAL PATENTING (1/69-12/81) - ALPHA LISTING

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EASTMAN KODAK COMPANY

- 4211844 - BILIRUBIN-SPECIFIC FUNGAL ENZYME PREPARATION
- 4269938 - ASSAY OF PEROXIDATIVELY ACTIVE MATERIALS
- 4275151 - HYDROLYSIS OF PROTEIN-BOUND CHOLESTEROL ESTERS
- 4275152 - HYDROLYSIS OF PROTEIN-BOUND CHOLESTEROL ESTERS
- 4275164 - PROCESS AND NUTRIENT MEDIUM FOR GROWING MICROORGANISM
- 4275166 - PROCESS FOR THE RECOVERY OF INTRACELLULAR ENZYME
- 4276377 - CREATININE KINOMOTOKLASE FREE FROM UREASE ACTIVITY
- 4283491 - ANALYTICAL ELEMENTS WITH IMPROVED REAGENT STABILITY

E-C APPARATUS CORPORATION

- 4013513 - ION EXCHANGE CHROMATOGRAPHIC ISOENZYME SEPARATION AND ISOLATION

ECONOMICS LABORATORY INC.

- 3773623 - SLIME CONTROL IN INDUSTRIAL WATERS
- 3824184 - SLIME CONTROL IN INDUSTRIAL WATERS

E. I. DU PONT DE NEMOURS AND COMPANY

- 3542662 - ENZYME ELECTRODE
- 3542663 - PROCESS FOR ISOLATION BY CRYSTALLIZATION OF THE NO-FE PROTEIN OF THE ENZYME NITROGENASE
- 3686578 - ENZYME ZINC PHOSPHORUS PRIVILEGE CRYSTALLIZATION
- 3794037 - PROCESS FOR MEASURING CARBON DIOXIDE CONTENT OF THE BODY FLUID
- 4039383 - PROCESS FOR PRODUCING MALTOPEPTASE

EISAI CO., LTD.

- 3513074 - METHOD OF ACCELERATING THE CRYSTALLIZATION OF ALBUMEN LYSOZYME
- 3523871 - STABILIZATION OF CATALASE
- 3716454 - PROCESS FOR THE PRODUCTION OF ALPHA-AMINOBENZYLPHENICILLIN
- 3904479 - PROCESS FOR PREPARING PANCREATIC ELASTASE
- 4071410 - PROCESS FOR PREPARATION OF PANCREATIC ELASTASE

ELI LILLY AND COMPANY

- 3542981 - METHOD FOR PRODUCING L-ASPARAGINASE
- 3542981 - METHOD FOR PRODUCING L-ASPARAGINASE AND A METAL OR METALLOID AND METHOD OF ITS MANUFACTURE
- 3904480 - ENHANCED PRODUCTION OF PLASMINOGEN ACTIVATOR
- 3972774 - ENZYMATIC DE-ESTERIFICATION OF CEPHALOSPORIN PARA-NITROBENZYL ESTERS

ENZYMIC MALT COMPANY LIMITED, THE AND

- 3485720 - MALTING OF BARLEY OR OTHER CEREALS
- 3619373 - PROCESS FOR MALTING GERMINATED GRAIN

E. R. SQUIBB & SONS, INC.

- 3446705 - METHOD FOR THE PRODUCTION OF 6-AMINO-PENICILLANIC ACID
- 3462487 - CHEMICAL COMPOUNDS AND METHODS FOR PREPARING THE SAME
- 3462487 - CHEMICAL COMPOUNDS AND METHODS FOR PREPARING THE SAME
- 3492465 - PHENOL-ETHYLENE-AMINE-12,12-ALPHA-SCOTETRACYCLINE-12-OIC ACID-6,12-LACTONES
- 3511754 - PROCESS FOR ISOLATING L-ASPARAGINASE
- 3511755 - SYNTHESIS OF L-ASPARAGINASE
- 3517036 - HYDROXY, ACYLOXY AND 11-KETO-1,3,5(10),7-ESTRATETRAENES
- 3528887 - SYNTHESIS OF L-ASPARAGINASE
- 3576719 - ALKALINE PROTEINASE
- 3646218 - PENICILLIC ACID DERIVATIVES AND RELATED COMPOUNDS AND METHOD OF PRODUCING THEM
- 3734830 - CONTINUOUS PROCESS FOR PREPARING DELTA-DEHYDROGENASE
- 3817835 - PROCESS FOR THE PRODUCTION OF ANTIMICROBIAL AGENTS
- 4205068 - +62 -LACTAMASE INHIBITOR EM4615

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

ETABLISSEMENT PUBLIC OET" AGENCE NATIONALE DE VALORISATION O
4029819 - SUPEROXIDE DISMUTASE AND ITS APPLICATION AS AN OXIDATION INHIBITOR

ETHYL CORPORATION

4262092 - PROCESS FOR PRODUCING N-ACYL-O-PHENYLALANINE ESTER

EXXON RESEARCH + ENGINEERING CO.

3616222 - PROCESS FOR SACCHARIFICATION OF CELLULOSIC AND WOODY TISSUES BY FUNGI OR ENZYMES FROM FUNGI
3897308 - IMMOBILIZED ENZYMES AND METHOD FOR PREPARATION
4250259 - MICROBIOLOGICAL PRODUCTION OF KETONES FROM C/3 \ -C/6 \ SECONDARY ALCOHOLS
4266034 - METHOD FOR PRODUCING MICROBIAL CELLS AND USE THEREOF TO PRODUCE OXIDATION PRODUCTS
4268630 - MICROBIOLOGICAL PRODUCTION OF KETONES FROM C/3 \ -C/6 \ ALKANES
4269940 - MICROBIOLOGICAL ALKANE OXIDATION PROCESS

FABRICA DE ANTIBIOTICE IASI

3798127 - MEDIUM FOR THE CULTURE OF THE ESCHERICHIA COLI STRAIN

FMC CORPORATION

3666399 - ENZYMATIC PEROXYPHOSPHATE HYDROLYSIS

FORSCHUNGSINSTITUT FÜR DIE GARUNGSGEWERBE

3616235 - PROCESS FOR PRECIPITATING ENZYMES AND ENZYMATIC INACTIVE PROTEINS IN SOLUTION WITH SYNTHETIC TANNING MATERIALS

FORSYTH DENTAL INFIRMARY FOR CHILDREN

4250262 - METHOD OF PREPARING A PURIFIED GLUCOSYLTRANSFERASE

FUJII OIL COMPANY, LIMITED

4024000 - STABILIZATION OF BETA-AMYLASE IN AQUEOUS MEDIUM

FUJII PHOTO FILM CO., LTD

3746621 - PREPARATION OF ENZYME-CONTAINING MICROCAPSULE

FUJISAWA PHARMACEUTICAL CO., LTD.

4259134 - NOVEL HYALURONIDASE BMP-8231 AND PRODUCTION THEREOF

GATES RUBBER COMPANY

3808102 - PROCESS FOR PREPARING ALPHA AMYLASE

GB FERMENTATION INDUSTRIES, INC.

4065580 - LIPOLYTIC ENZYME FLAVORING SYSTEM
4086139 - DIFFERENTIAL INACTIVATION OF AMYLASE IN AMYLASE-PROTEASE MIXTURES
4101379 - ENZYME COMPLEX HYDROLYZING BACTERIAL MUCUS
4136201 - MICROBIAL RENNIN

G. D. SEARLE & CO.

3776900 - STABILIZATION OF REDUCED COENZYMES
3829010 - PHOTOMETRIC METHOD FOR DETERMINING LACTIC ACID DEHYDROGENASE OR GLUCOSE-6-PHOSPHATE DEHYDROGENASE
3935185 - POLYNUCLEOTIDES OF POLY(5-HYDROXYCYTIDYLIC ACIDS)
3947324 - METHOD FOR ISOLATING HIGH PURITY PEROXIDASE

GENERAL ELECTRIC COMPANY

3812013 - SOLUBLE CELLULASE ENZYME PRODUCTION
4094742 - PRODUCTION OF ETHANOL FROM CELLULOSE USING A THERMOPHILIC MIXED CULTURE

GENERAL FOODS CORPORATION

3565764 - SUGAR PRODUCTION FROM AMYLACEOUS MATERIALS

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

GESELLSCHAFT FÜR BIOTECHNOLOGISCHE FORSCHUNG MBH
4064011 - PROCESS FOR PRODUCING ECORI RESTRICTION ENDONUCLEASE WITH <1 E. COLI <B MUTANTS
4144130 - PROCESS FOR THE SEPARATION OF ENZYMES

GIST-BROCADES N.V.

3838007 - WATER-INSOLUBLE ENZYME COMPOSITION
3855064 - PREPARATION OF A PROTEOLYTIC ENZYME
3912593 - WATER-INSOLUBLE NITROGEN-CONTAINING BIOLOGICALLY ACTIVE ORGANIC SUBSTANCES
4002572 - ALKALINE PROTEASE PRODUCED BY A BACILLUS
4242219 - NOVEL ENZYME PARTICLES AND THEIR PREPARATION

GIVAUDAN CORPORATION

4137126 - PROCESS FOR PREPARING GLUCOSE ISOMERASE USING STREPTOMYCES GLAUESCENS MUTANTS
4201857 - NOVEL CONDENSATION PRODUCTS HAVING HIGH ACTIVITY TO INSOLUBILIZE PROTEINS AND PROTEIN-INSOLUBILIZED PRODUCTS

GLAXO LABORATORIES LIMITED

3438310 - HYDROLYSIS OF THE ACETOXYMETHYL GROUP AT THE 3- POSITION OF THE CEPHALOSPORIN NUCLEUS
3658649 - CEPHALOSPORIN DERIVATIVES
3697378 - DEXTRINIZATION OF STARCH WITH X-AMYLASE FROM BACILLUS COAGULANS
3801458 - PROCESS FOR PREPARING CEPHALOSPORIN DERIVATIVES
3880713 - CEPHALOSPORIN COMPOUNDS
3904480 - CEPHALOSPORIN-1,3-GLUCANASE
3976546 - CEPHALOSPORINS
4011136 - BIOCHEMICAL PROCESS
4075061 - METHOD FOR PRODUCING CEPHALOSPORINS
4164447 - D-TRANSCARBAMOYLASE

GODD SHUSEI KABUSHIKI KAISHA

3661594 - PRODUCTION OF BACTERIAL RENNET FOR MAKING CHEESE
3930954 - NEUTRAL PROTEASE USEFUL FOR ANIMAL TISSUE AND CELL CULTURE
3948725 - NEUTRAL PROTEASE USEFUL FOR ANIMAL TISSUE AND CELL CULTURE

GRAY INDUSTRIES, INC.

3645849 - STABILITY OF ENZYMES

GREAT WESTERN SUGAR COMPANY

4097333 - ENZYMIC METHOD OF PRODUCING GLUCOSE FROM ETHYLENE TREATED CELLULOSE
4241185 - METHOD OF STABILIZING +60 -GALACTOSIDASE

GREEN CROSS CORPORATION

3542646 - PROCESS FOR FRACTIONALLY OBTAINING UROKINASE AND BLOOD COAGULATION ACCELERATOR IN HUMAN URINE
3527642 - LYSOZYME SALTS
3626842 - HUMAN PLACENTAL HYALURONIDASE
4010074 - METHOD FOR PURIFICATION AND RECOVERY OF UROKINASE
4104125 - PROCESS FOR PRODUCING HUMAN LYSOZYME
4286063 - METHOD FOR RECOVERING THROMBOLYTIC PREPARATION
4306025 - METHOD FOR RECOVERING MYELOPEROXIDASE AND PHARMACEUTICAL COMPOSITION CONTAINING MYELOPEROXIDASE AS MAJOR CONSTITUENT

HAYASHIBARA BIOCHEMICAL LABORATORIES INCORPORATED

3812011 - METHOD OF CONVERTING STARCH TO BETA-CYCLODEXTRIN
3932285 - METHOD OF PRODUCING MALTOSE OF HIGH PURITY
3988206 - HEAT STABLE CYCLODEXTRIN GLYCOSYLTRANSFERASE
4028186 - PROCESS FOR THE PRODUCTION OF SACCHARIFIED STARCH PRODUCTS

HAYASHIBARA COMPANY

3432203 - EXTRACTION OF BETA-AMYLASE FROM WHEAT BRAN

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

(CONTINUED)

- HAYASHIBARA COMPANY
 3560345 - PROCESS FOR PRODUCING BACTERIAL ISOAMYLASE
 3622460 - PROCESS FOR PRODUCING A LARGE AMOUNT OF ISOAMYLASE
 3632475 - PROCESS FOR PREPARING LONG-CHAIN AND SHORT-CHAIN AMYLOSES FROM STARCHES
 3677896 - PROCESS FOR PREPARING CRYSTALLINE MALTULOSE
 3691013 - PROCESS FOR PRODUCING KETOSE
 3692580 - PROCESS FOR THE PRODUCTION OF STARCH SYRUPS
 3716144 - METHOD FOR THE PRODUCTION OF OLIGOSACCHARIDES
 3716435 - METHOD FOR PRODUCING ISOAMYLASE BY FERMENTATION
 3721605 - PROCESS FOR PRODUCING AMYLOSE IN INDUSTRIAL SCALE
 3723253 - PRODUCTION OF ALPHA-1,6-GLUCOSIDASE
 3729380 - PROCESS FOR PRODUCING LOW MOLECULAR AMYLOSE ON A COMMERCIAL BASIS
 3730840 - PROCESS FOR PREPARING LOW MOLECULAR WEIGHT AMYLOSES
 3741873 - METHOD FOR THE STABILIZATION OF ALPHA-1,6-GLUCOSIDASES
 3766014 - PRODUCTION OF ALPHA-1,6-GLUCOSIDASE⁵
 3769168 - PROCESS FOR THE PURIFICATION OF AMYLASES
 3795584 - PROCESS FOR PRODUCING HIGH PURITY MALTULOSE
 3801461 - PROCESS FOR THE EXTRACTION OF ENZYMES FROM MICROORGANISMS
 3801462 - PRODUCTION OF BETA-AMYLASE
 3804715 - PROCESS FOR PREPARING SUGAR CONTAINING MALTULOSE OF HIGH PURITY
 3805718 - METHOD FOR PRODUCING BETA-GLUCOSIDE BY BACTERIAL FERMENTATION
 3805794 - METHOD FOR PRODUCING BETA-GLUCOSIDE
 3838006 - PROCESS FOR PRODUCING HEAT-RESISTANT STARCH SYRUPS
 3870704 - NITROGEN CONTAINING AMYLOSE DERIVATIVES
 3886738 - METHOD FOR PURIFYING CYCLODEXTRIN-PRODUCING ENZYMES
 4001435 - PROCESS FOR PREPARING FOODS AND DRINKS
- HAZLETON LABORATORIES, INCORPORATED
 3575811 - METHOD FOR THE DETECTION OF CANCER
- HENKEL + CIE G.M.B.H.
 4016039 - PROCESS FOR THE RECOVERY OF PROTEINS FROM AQUEOUS SOLUTIONS OF PROTEINS
 HENKEL KOMMANDITGESELLSCHAFT AUF AKTIEN(HENKEL KGAA)
 4052732 - PROCESS OF PRODUCING ACID STABLE PROTEASE
 4142939 - STABILIZED LIQUID ENZYME CONTAINING COMPOSITIONS
- HITACHI CHEMICAL COMPANY, LTD.
 4025390 - METHOD FOR RECOVERING UROKINASE FROM A UROKINASE-CONTAINING SOLUTION
 4048014 - METHOD FOR OBTAINING UROKINASE
- HOECHST AKTIENGESSELLSCHAFT
 3490995 - PROCESS FOR THE BIOSYNTHESIS OF CELL-BOUND PULLULANASE BY AEROBACTER AEROGENES
 3511753 - PROCESS FOR PREPARING A LIPOLYTIC ENZYME
- HOFFMANN-LA ROCHE INC.
 3755086 - DIAGNOSTIC METHOD UTILIZING SYNTHETIC DEOXYRIBONUCLEOTIDE OLIGOMER TEMPLATE
 3863508 - PROCESS FOR THE PREPARATION OF GUANOSINE TETRA- AND PENTA-PHOSPHATES AND PRODUCTS
- HOKKAIDO SUGAR COMPANY, LTD.
 3664927 - APPARATUS FOR CONTINUOUS HYDROLYSIS OF RAFFINOSE
 3836432 - CONTINUOUS PROCESS FOR THE HYDROLYSIS OF RAFFINOSE
 3867256 - METHOD FOR PRODUCTION OF ALPHA-GALACTOSIDASE BY MICROORGANISM
 3894913 - METHOD FOR PRODUCTION OF ALPHA-GALACTOSIDASE
 3957578 - METHOD FOR MANUFACTURE OF ALPHA-GALACTOSIDASE BY MICROORGANISM
 3972777 - METHOD FOR RECOVERY OF REFINED ALPHA-GALACTOSIDASE

ENZYMES PER SE

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

HONEYWELL, INC.
3941659 - BLOOD ALCOHOL ANALYZER

HOYASHIBARA BIOCHEMICAL LABORATORIES, INCORPORATED
3806421 - AMYLASE INHIBITOR AND METHOD OF PRODUCING THE SAME

HYCEL, INC.
4229369 - TRIS (HYDROXYMETHYL) AMINOMETHANE SALT OF 2-MERCAPTOSUCCINIC ACID

ICN PHARMACEUTICALS INC.
3978545 - 1,2,4-TRIAZOL E-3-CARBOXAMIDES AS ANTIVIRAL AGENTS

IOEMITSU KOSAN COMPANY LIMITED
3983008 - METHOD OF EXTRACTING USEFUL COMPONENTS FROM MICROBIAL CELLS

IMPERIAL CHEMICAL INDUSTRIES LIMITED
3713981 - ENZYMES FROM ARMILLARIA WELLESII
3892629 - PROCESS FOR GROWING A FUNGUS
3903069 - POLYPEPTIDES OBTAINED BY MODIFICATION OF PORCINE OR BOVINE INSULIN
4032633 - POLYPEPTIDES
4035485 - POLYPEPTIDES
4053361 - PROCESS FOR THE PREPARATION OF GLUCOSE ISOMERASE USING CURTIOBACTERIUM
4059489 - PRODUCTION OF GLUCOSE ISOMERASE
4069104 - CONVERSION OF ALDOSE TO KETOSE IN THE PRESENCE OF OXYANIONS OR MIXED OXYANIONS OF TIN OR GERMANIUM
4183781 - CIRCULATION OF GAS/LIQUID MIXTURES
4234687 - +62 - GALACTOSIDASE

INOLEX CORPORATION

3796638 - PROCESS FOR PREPARING HIGH ACTIVITY PEPSIN

INSTITUT FRANCAIS DU PETROLE

3772152 - PROCESS FOR MANUFACTURING ENZYMES FROM HYDROCARBONS

INSTITUT NATIONAL DE LA SANTE ET DE LA RECHERCHE MEDICALE
4298686 - METHOD OF IMMUNOENZYMATIC ASSAY UTILIZING +66 /5\ ,3+L -KETO-STERIOD ISOMERASE

INSTITUTO DE FARMACOLOGIA ESPANOLA, S.L. (FUNDACION MARQUES
4038419 - ENZYMATIC CLARIFICATION OF LIQUIDS

INTERNATIONAL TELEPHONE AND TELEGRAPH CORPORATION

4298948 - MODIFIED ENZYME SYSTEM TO INHIBIT BREAD FIRING METHOD FOR PREPARING SAME AND USE OF SAME IN BREAD AND OTHER BAKERY PRODUCTS

IOWA STATE UNIVERSITY RESEARCH FOUNDATION INC.

4228150 - METHOD OF INHIBITING OXTRANSUCRASE AND ORAL COMPOSITIONS FOR USE THEREIN

ISTITUTO STEROTERAPICO E VACCINOGENO TOSCANO S.P.A.

4220714 - COMPOSITION FOR INHIBITING ADENYLATE-KINASE AND ITS USE

J. K. AND SUSIE L. WADLEY RESEARCH INSTITUTE AND BLOOD BANK

3597323 - METHOD OF PURIFICATION OF ASPARAGINASE

3616230 - METHOD FOR PRODUCTION OF L-ASPARAGINASE

3637462 - PURIFICATION OF ENZYMES

JOSEPH E. SEAGRAM SONS, INC.

3988204 - PRODUCTION OF GLUCOAMYLASE FOR CONVERSION OF GRAIN WASHES IN THE PRODUCTION OF GRAIN SPIRITS

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

- J. P. SIMPSON AND CO. (ALNWICK) LIMITED
4277505 - PROCESS FOR THE MALTING OF GRAIN
- KABUSHIKI KAISHA HAYASHIBARA SEIBUTSU KAGAKU KENKYUUD
4254227 - PROCESSES FOR PRODUCING SYRUPS OF SYRUP SOLIDS CONTAINING FRUCTOSE-TERMINATED OLIGOSACCHARIDES
- KABUSHIKI-KAISHA HAYASHIBARA SELBUTSUKAGAKU KENKYUUD
4032403 - PROCESS FOR THE PRODUCTION OF SACCHARIFIED STARCH PRODUCTS WHEREIN MALTOSE IS THE PREDOMINANT CONSTITUENT
- KALI-CHEMIE PHARMA GMBH
4019958 - CONTINUOUS PROCESS OF PRODUCING PANCREATIN AND PRODUCT THEREOF
- KAYASHIBARA COMPANY
3703440 - PROCESS FOR THE PRODUCTION OF STARCH SYRUPS THAT HAVE FRUCTOSE ON THEIR MOLECULAR ENDS
- KEEVER COMPANY
3495862 - METHOD OF MAKING A ZINC LIPASE COMPLEX
- KEN HAYASHIBARA
3819484 - PROCESS FOR PREPARING SUCROSE-STARCH SWEETENER FREE FROM REDUCING SUGAR
- KERNFORSCHUNGSANLAGE JULICH GMBH
4250261 - PROCESS FOR THE MICROBIAL PRODUCTION OF ALCOHOLOXIDASE
- KETTERING, CHARLES F.. FOUNDATION
3560344 - REDUCTION OF GASEOUS NITROGEN TO AMMONIA
- KETTERING SCIENTIFIC RESEARCH, INC.
3423289 - REDUCTION OF GASEOUS NITROGEN TO AMMONIA
- KIKKOWAN SHOUY CO., LTD.
3519372 - ACID RESISTANT LIPASE AND PROCESS FOR PREPARATION THEREOF
3645950 - PREPARATION OF ACID CARBOXYPEPTIDASE
3674644 - PRODUCTION OF NOVEL ACIDSTABLE AND THERMOSTABLE PROTEASE
3713983 - METHOD FOR PREPARING A THERMOSTABLE AND ALKALI-STABLE PROTEASE
3717470 - HYDROLYSIS OF GLUTAMINE WITHIN FOODS AND BEVERAGES TO GLUTAMIC ACID
3721606 - GLUTAMINASE GA
3796533 - PEPTIDOGUTAMINASE
3816530 - BACTERIAL CELLWALL LYTIC ENZYME AND PROCESS FOR PRODUCING THE SAME
3820530 - METHOD FOR PRODUCING A NOVEL CYCLOOLIGOMER
3926726 - PROCESS FOR PRODUCING CYCLOOLIGOMER AND CYCLOOLIGOMERIC ACID BY FERMENTATION
4061540 - CHOLESTEROL OXIDASE AND PROCESS FOR PREPARING SAME
4200694 - NOVEL PECTIN ESTERASE, PROCESS FOR ITS PRODUCTION, AND PROCESS FOR PRODUCING O-METHOXYLATED PECTIN BY THE USE OF SAID PE CTIN ESTERASE
- 4247632 - METHYLGUANIDINE-DECOMPOSING ENZYME AND PROCESS FOR ITS PRODUCTION
- KIRIN BEER KABUSHIKI KAISHA
3716452 - LYSIS OF YEAST CELL WALLS
3917510 - LYSIS OF YEAST CELL WALLS
- KOCH-LIGHT LABORATORIES LIMITED
4043869 - WATER INSOLUBLE BIOLOGICALLY ACTIVE MATERIAL
- KONINKLIJKE NEDERLANDSCHE GISTEN-EN SPIRITUSFABRIEK N.V.
3801463 - PREPARATION OF ENZYMES IN PARTICULATE FORM

ORGANIZATIONAL PATENTING (1/59-12/81) - - ALPHA LISTING

KUMIAI CHEMICAL INDUSTRY CO., LTD.

3890198 - CELL WALL-LYSING COMPLEX ENZYMES AND A PROCESS FOR THE PRODUCTION THEREOF
 3969189 - CELL WALL-LYSING COMPLEX ENZYMES AND A PROCESS FOR THE PRODUCTION THEREOF
 4032663 - PROCESS FOR USING CELL WALL-LYSING ENZYMES
 4229539 - +62 -GALACTOSIDASE AND PRODUCTION THEREOF

KURTH MALTING CORPORATION

3759792 - METHOD OF MALTING
 4251630 - PREPARATION OF MALT HIGH IN ALPHA-1,6-HYDROLASE

KYOWA HAKKO KOGYO CO., LTD.

3670427 - PROCESS FOR PRODUCING METHIONINE DECARBOXYLASE
 3594282 - PROCESS FOR PURIFYING L-ASPARAGINASE
 3607654 - PROCESS FOR PRODUCING PURIFIED L-ASPARAGINASE
 3607655 - PROCESS FOR PRODUCING MILK CLOTTING ENZYME
 3620925 - PROCESS FOR PURIFYING L-ASPARAGINASE
 3627639 - PROCESS FOR PRODUCING L-ASPARAGINASE
 3655514 - PROCESS FOR PURIFYING L-ASPARAGINASE
 3669842 - PURIFICATION OF L-ASPARAGINASE
 3677899 - PROCESS FOR PRODUCING CELLULASE
 3682777 - PROCESS FOR PRODUCING PENICILLIN DERIVATIVES
 3682778 - PRODUCTION OF MICROBIAL CELL-LYTIC ENZYMES
 3694632 - PROCESS FOR PRODUCING LIPASES BY MICROORGANISM OF THE BASIDIOMYCETES
 3705516 - PROCESS FOR PRODUCING AMINOGLUCOSYL PENICILLIN
 3717548 - METHOD FOR PREPARING AMINOGLUCOSYL PENICILLIN
 3776816 - PROCESS FOR PRODUCING STEROID DEHYDROGENASE
 3787288 - METHOD FOR PREPARING ALPHA-AMINOBENZYL PENICILLIN
 3819481 - PROCESS FOR PREPARING NICOTINAMIDE ADENINE DINUCLEOTIDE PHOSPHATE
 3827936 - PROCESS FOR PREPARING CYCLIC ADENOSINE MONOPHOSPHATE
 3838009 - PROCESS FOR PRODUCING DETERGENT RESISTING ALKALINE PROTEASE
 3878191 - PROCESS FOR PREPARING SOLUBLE FLAVONOID GLYCOSIDES
 4011138 - PROCESS FOR THE PREPARATION OF CHOLESTEROL ESTERASE
 4087329 - CREATININE DESIMIDASE AND ITS METHOD OF PRODUCTION
 4134793 - CREATININE DESIMIDASE AND PROCESS FOR THE QUANTITATIVE DETERMINATION OF CREATININE
 4202941 - GLYCEROL OXIDASE AND PROCESS FOR THE PRODUCTION THEREOF AND METHOD FOR THE QUANTITATIVE DETERMINATION OF GLYCEROL BY GLY
 4240650 - PROCESS FOR THE PREPARATION OF CHOLINE OXIDASE BY FERMENTATION
 4255519 - GLYCEROL OXIDASE AND PROCESS FOR THE PRODUCTION THEREOF
 4273874 - ACIDIC URICASE AND PROCESS FOR PRODUCTION THEREOF

LABATT, JOHN LIMITED

3482997 - MAKING CHEESE USING A MODIFIED BACTERIAL ENZYME COMPLEX FROM THE GENUS BACILLUS
 3507750 - PROCESS FOR PREPARING MILK COAGULATING ENZYME COMPLEX

LEAF PROTEINS, INC.

4268632 - PROCESS FOR ISOLATION OF RIBULOSE 1,5-DIPHOSPHATE CARBOXYLASE FROM PLANT LEAVES

LEHIGH UNIVERSITY

3677900 - METHOD OF PRODUCING COLLAGENASE WITH A SPECIES OF VIBRIO

LES PRODUITS ORGANIQUES OU SANTERRE ORGAN

3933586 - METHOD OF MAKING L-ASPARTIC ACID FROM FUMARIC ACID

LEVER BROTHERS COMPANY

3652397 - PREPARATION OF PHOSPHATIDES
 3663371 - METHOD OF PRODUCING DEXTRANASE

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

(CONTINUED)

LEVER BROTHERS COMPANY
 3723327 - GRANULAR PROTEOLYTIC ENZYME COMPOSITION
 3748233 - ALKALINE PROTEASE, METHOD FOR ITS PRODUCTION, AND DETERGENT COMPOSITION
 3784476 - DETERGENT COMPOSITION
 4009076 - ENZYME GRANULES
 4016041 - PROCESS OF MAKING GRANULAR ENZYMES OF REDUCED STICKINESS
 4261868 - STABILIZED ENZYMATIC LIQUID DETERGENT COMPOSITION CONTAINING A POLYALKANOLAMINE AND A BORDON COMPOUND

 LIFELINE PRODUCTS, INC.
 4211842 - STARCH-DEGRADING ENZYMES DERIVED FROM +1 CLADOSPORIUM RESINAE

 LKB-PRODUKTER AB
 4235961 - METHOD FOR PHOTOMETRIC DETERMINATION OF THE SUBUNIT B OF CREATINE KINASE AND A REAGENT FOR CARRYING OUT THE METHOD
 4246340 - METHOD AND REAGENT FOR BIOLUMINESCENCE

 LOUISIANA STATE UNIVERSITY FOUNDATION
 4062727 - PROCESS FOR MANUFACTURING HIGH DENSITY CELL CULTURES

 LYCKEBY STARKELSEFABRIK AB
 3651221 - SUGAR SUBSTITUTE ADDITIVE PREPARATIONS OF SORBITOL AND GLUCONIC ACID

 MALLINCKRODT, INC.
 3950133 - REAGENT FORMULATIONS FOR ASSAYING BIOLOGICAL SPECIMENS AND METHODS OF PREPARING AND USING SAME

 MARUKIN SHIYU COMPANY, LIMITED
 3725201 - MANUFACTURE OF URIDINE-5-DIPHOSPHOGLUCURONIC ACID

 MASSACHUSETTS GENERAL HOSPITAL
 4205129 - METHOD FOR PURIFYING GALACTOSYLTRANSFERASE ISOENZYMES AND PRODUCT
 4261976 - METHOD AND GLYCOPROTEIN COMPOSITION FOR INHIBITION OF GROWTH OF TRANSFORMED CELLS AND TUMORS

 MASSACHUSETTS INSTITUTE OF TECHNOLOGY
 4066510 - ASSAY FOR MUTAGENESIS IN DIPLOID HUMAN LYMPHOBLASTS

 MAX-PLANCK-GESELLSCHAFT ZUR FORDERUNG DER WISSENSCHAFTEN E.V.
 3791928 - PURIFICATION OF THYMIDINE KINASE
 3810822 - PROCESS FOR OBTAINING A PHOSPHODIESTERASE FROM DICTYOSTELIUM DISCOIDEUM

 MAYASHIBARA COMPANY
 3669835 - PROCESS FOR PREPARING VITAMIN B/2\ GLUCOSIDE

 MEAD JOHNSON + COMPANY
 3594284 - LYOSOLAPHTHIN FERMENTATION WITH ACCELERATED TIME CYCLE

 MEDICO ELECTRONIC, INC.
 3899397 - GLUTAMIC OXALACETIC TRANSAMINASE ASSAY METHOD

 MEIJI SEIKA KAISHA LTD.
 3492204 - PROCESS FOR THE PRODUCTION OF ACID PROTEASE BY CULTIVATION OF MICROORGANISMS
 3868464 - PRODUCTION OF MALTASE WITH AMYLASES PRODUCED BY STREPTOMYCES
 3905869 - BACILLIDEPIDASE C, A NEW ALKALINE PROTEASE AND ITS PRODUCTION BY CULTIVATING BACILLUS BACTERIA
 3975235 - PROCESS FOR THE PRODUCTION OF CEPHAMYCIN TYPE ANTIBIOTIC SUBSTANCES
 3998696 - METHOD FOR PRODUCING MALTASE

 MEITO SANGYO KABUSHIKI KAISHA
 3950221 - PROCESS FOR IMPROVING THE QUALITY OF MICROBIAL RENNET

ORGANIZATIONAL PATENTING (1/59-12/81) - - ALPHA LISTING

MEITD SANGVO KABUSHIKI KAISHA

(CONTINUED)

4284494 - MICROBIAL LIPASE, PROCESS FOR ITS PREPARATION AND MICROBIOLOGICALLY PURE CULTURE THEREFOR

MERCK & CO., INC.

3622349 - PROCESS FOR THE PREPARATION OF 1-CHLORO-2- HYDROXYPROPYLPHOSPHONIC ACID
 3625401 - PURIFICATION OF DEXTRANS USING IRON SALTS
 3664926 - CRYSTALLIZATION OF L-ASPARAGINASE
 3716551 - DEUTERATED L-AMINO ACID MIXTURE
 3719562 - PRODUCTION OF POLYNUCLEOTIDE PHOSPHORYLASE
 3897309 - PROCESS FOR REMOVING PYROGENIC MATERIAL FROM AQUEOUS SOLUTIONS
 3897360 - METHOD FOR PREPARING A TYPING REAGENT
 4023600 - PRODUCTION OF A TYPING REAGENT
 4262734 - PROCESS FOR PRODUCING ANTIBIOTIC DESACETYL 890A/10
 4282322 - PROCESS FOR ENZYMIC DEACYLATION OF ANTIBIOTICS

MERCK E. A.G.

3591457 - ENZYMIC DECOMPOSITION OF GLUCANS

MERCK PATENT GESELLSCHAFT MIT BESCHRANKTER HAFTUNG

4067775 - PROCESS AND COMPOSITION FOR DETERMINING THE ACTIVITY OF CREATINEKINASE-MB

MICHAEL REESE RESEARCH FOUNDATION

4082612 - PLASMINOGEN ACTIVATOR COMPLEX

MIDWEST BIOCHEMICAL CORPORATION

4066056 - CONTROLLED RELEASE COMPOSITION CONTAINING STABILIZED UREASE

MIEUR SEIKA KAISHA, LTD.

3904717 - PRODUCTION OF NEW AMYLASES BY CULTIVATION OF STREPTOMYCES AND USES OF THESE NEW AMYLASES

MILES LABORATORIES INC.

3424654 - RECOVERY OF MICRODCCAL NUCLEASE
 3483084 - AMYLOGUCOSIDASE PURIFICATION
 3483085 - REMOVAL OF TRANSGLUCOSIDASE FROM AMYLOGUCOSIDASE
 3543090 - PROCESS FOR PURIFYING AMYLOGUCOSIDASE
 3592739 - MICROCLOTTING REAGENT, PRODUCT AND PROCESS THEREFOR
 3592790 - PURIFICATION OF LACTASE
 3625828 - PROCESS FOR PRODUCTION OF GLUCOSE ISOMERASE
 3634195 - PRODUCTION OF LIPASE
 3655513 - PURIFICATION OF PROTEASE
 3661716 - PROCESS FOR SIMULTANEOUS FRACTIONATION AND PURIFICATION OF PROTEASE AND RIBONUCLEASE OF RHIZOPUS MOLD
 3728224 - ENZYME PURIFICATION PROCESS
 3737377 - PURIFICATION OF LACTASE
 3792039 - POLY 2'-FLUORO-2''-DEOXYRIBIDYLIC ACID
 3917513 - REMOVAL OF TRANSGLUCOSIDASE FROM AMYLOGUCOSIDASE
 3952037 - COMPOSITION FOR STABILIZING AN ENZYME-CONTAINING REAGENT
 4007938 - PROCESS FOR CONDITIONING BACTERIAL CELLS CONTAINING GLUCOSE ISOMERASE ACTIVITY
 4007939 - COMPOSITION FOR STABILIZING AN ENZYME-CONTAINING REAGENT
 4061541 - PREPARATION OF ALKALINE ALPHA-AMYLASE
 4070242 - METHOD FOR THE PREPARATION OF PROSTAGLANDIN SYNTHETASE
 4129417 - MULTISYSTEM TEST MEANS
 4134792 - SPECIFIC BINDING ASSAY WITH AN ENZYME MODULATOR AS A LABELING SUBSTANCE
 4186251 - COMPOSITION AND METHOD FOR DETERMINATION OF CHOLESTEROL
 4225485 - CHEMILUMINESCENT NAPHTHALENE-1,2-DICARBOXYLIC ACID HYDRAZIDE-LABELED POLYPEPTIDES AND PROTEINS
 4226978 - +62 - GALACTOSYL-UMBELLIFERONE-LABELED AMINGLYCOSIDE ANTIBIOTICS AND INTERMEDIATES IN THEIR PREPARATION
 4230798 - UNITIZED URIC ACID TEST COMPOSITION AND DEVICE

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

MILES LABORATORIES INC.

- (CONTINUED)
 4238395 - DIMETHYL 7-+8 +107 -N-(PHTHALIMIDIO)ALKYL+9 AMINONAPHTHALENE-1,2-DICARBOXYLATES
 4238565 - SPECIFIC BINDING ASSAY WITH A PROSTHETIC GROUP AS A LABEL COMPONENT
 4251632 - PREPARATION OF A BACTERIAL CELL AGGREGATE
 4259233 - BETA-GALACTOSYL-UMBELLIFERONE-LABELLED PROTEIN AND POLYPEPTIDE CONJUGATES
 4268631 - ALPHA-GLUCOSIDASE PREPARATION
 4272723 - CHEMILUMINESCENT PHTHALHYDRAZIDE-LABELLED AN ENZYME-CLEAVABLE SUBSTRATE AS LABEL
 4297273 - CHEMILUMINESCENT PHTHALHYDRAZIDE-LABELLED PROTEIN AND POLYPEPTIDE CONJUGATES

MITSUBISHI CHEMICAL INDUSTRIES LTD.

- 3974031 - PROCESS FOR PRODUCING L-CYSTEINE OR ITS DERIVATIVES
 4078970 - INSOLUBILIZED GLUCOSE ISOMERASE
 4106993 - METHOD FOR PRESERVATION OF AQUEOUS GLUCOSE ISOMERASE SOLUTION
 4205127 - PROCESS FOR THE REMOVAL OF AN INSOLUBILIZED GLUCOSE ISOMERASE
 4304864 - LONG-CHAIN ACYL-COENZYME-A SYNTHETASE

MITSUBISHI GAS-CHEMICAL COMPANY, INC.

- 4092220 - PROCESS FOR MANUFACTURE OF L(+)-TARTARIC ACID OR SALTS THEREOF

MITSUI SUGAR CO., LTD.

- 4191810 - PROCESS FOR THE PRODUCTION OF IMMOBILIZED GLUCOSE ISOMERASE

MOCHIOA PHARMACEUTICAL CO., LTD.

- 3723251 - METHOD FOR EXTRACTING UROKINASE
 3723252 - METHOD FOR REMOVING PYROGENIC SUBSTANCES OUT OF UROKINASE
 4218335 - STABILIZER FOR AN IMMUNOCHEMICAL MEASURING REAGENT

MONSANTO COMPANY

- 3573170 - ENZYME PRODUCTS
 3578460 - PROCESS FOR THE PREPARATION OF PROTEINACEOUS MATERIALS
 3578461 - PROCESS FOR THE PREPARATION OF PROTEINACEOUS MATERIALS
 3578461 - RESISTANCE OF POLYMERIC N-HYDROLYZABLES
 3592736 - PURIFICATION AND SEPARATION OF NEUTRAL PROTEASE FROM PIGMENT AND ALKALINE PROTEASE
 3592737 - PURIFICATION AND FRACTIONATION OF PROTEASE AND AMYLASE ACTIVITIES IN ENZYME MIXTURE
 3592738 - PURIFICATION AND RECOVERY OF NEUTRAL AND ALKALINE PROTEASE USING CATIONIC SULFONATED PHENOL-FORMAL-DEHYDRE RESIN
 3594325 - AGGLOMERATED ENZYME PRODUCTS
 3616232 - PURIFICATION AND FRACTIONATION OF ENZYME MIXTURE FROM AQUEOUS SOLUTION
 3623955 - PURIFICATION AND RECOVERY OF USING CATIONIC EXCHANGE RESIN
 3634258 - DETERGENT COMPOSITIONS CONTAINING SOLUBLE POLYMER-ENZYME PRODUCT
 3634267 - ENZYME ADDITIVES
 3692630 - COMPOSITION FOR PREPARING PROCESS CHEESE
 3796635 - PROCESS FOR THE PREPARATION OF HEAT RESISTANT NEUTRAL PROTEASE ENZYME
 3846239 - PROCESS FOR THE PREPARATION OF HEAT-RESISTANT ALPHA-GALACTOSIDASE ENZYME
 4045257 - TRIGLYCERIDES DETERMINATION METHOD
 4190708 - PRODUCTION OF UROKINASE

NALCO CHEMICAL COMPANY

- 4055467 - ENZYMIC DISPERSION OF BIOLOGICAL SLIMES

NATIONAL PATENT DEVELOPMENT CORPORATION

- 3576760 - WATER SOLUBLE ENTRAPPING

NATIONAL RESEARCH DEVELOPMENT CORPORATION

- 3657416 - THROMBIN-LIKE DEFIBRINATING ENZYME FROM THE VENOM ANCISTROON RHODOSTOMA
 3674767 - NOVEL POLYMERIC MATERIALS CONTAINING TRIAZINYL GROUPS
 3907642 - CHOLESTEROL OXIDASE AND METHOD OF EXTRACTING FROM NOCAROTA

ORGANIZATIONAL PATENTING (1/59-12/81) - - ALPHA LISTING

(CONTINUED)

NATIONAL RESEARCH DEVELOPMENT CORPORATION

3907645 - CHOLESTEROL ASSAY
4275000 - PEPTIDE MACROMOLECULAR COMPLEXES

NATIONAL STARCH AND CHEMICAL CORPORATION

3893890 - PROCESS FOR INHIBITING THE ACTION OF PEPSIN

NISON RIKI SEISHI KABUSHIKI KAISHA

3770672 - PASTE FOR GUMMED TAPE AND PROCESS FOR PRODUCING THE SAME FROM HYDROLYZED STARCH

NIPPON OIL COMPANY LTD.

4086138 - PROCESS FOR PRODUCING GLUCOSE ISOMERASE

NIPPON SODA COMPANY LIMITED

4225675 - ADSORBENT FOR UROKINASE AND PROCESS FOR THE PRODUCTION OF UROKINASE
4259448 - PROTEIN ADSORBENT AND PROCESS FOR THE PURIFICATION OF UROKINASE

NISHIN FLOUR MILLING CO., LTD.

3767528 - PROCESS FOR THE MANUFACTURE OF 3,4-OISUBSTITUTED PHENYL-1-ALANINES

NISSIN SHOKUJIN KAISHA, LTD.

3827939 - PROCESS FOR MAKING A PROTEASE FOR FOODSTUFFS

NITTO BOSEKI CO., LTD.

4209459 - NOVEL L-LEUCYL-4-HYDROXYANILIDE DERIVATIVES

NITTO CHEMICAL INDUSTRY CO., LTD.

4248968 - PROCESS FOR PRODUCING ACRYLAMIDE OR METHACRYLAMIDE UTILIZING MICROORGANISMS

NODA INSTITUTE FOR SCIENTIFIC RESEARCH

3767530 - PROCESS FOR PRODUCING HALOPHILIC ALPHA-AMYLASE
3767533 - PROCESS FOR PRODUCING URICASE
3896000 - HALOPHILIC NUCLEASE AND A PROCESS FOR PRODUCING THE SAME
4039584 - CREATININE AMIDOHYDROLASE AND CREATINE AMIDOHYDROLASE AND PROCESS FOR PRODUCING THEM

NUNO TERAPEUTISK LABORATORIUM A/S

3840433 - BEHAIRING OF LEATHER

NORTH AMERICAN CORPORATION

3446707 - COATING MALT WITH GELATINIZED STARCH
3446708 - MALT PELLETS

NORTH CAROLINA STATE UNIVERSITY AT RALEIGH

4284553 - REVERSIBLE METHOD FOR COVALENT IMMOBILIZATION OF BIOCHEMICALS

NOVO INDUSTRY A/S

3890591 - PRODUCTION OF GLUCOSE ISOMERASE BY BACILLUS COAGULANS
3907651 - IMMOBILIZATION OF GLUCOSE ISOMERASE
4025389 - PROCESS AND ISOMERIZING GLUCOSE
4042460 - METHOD FOR PRODUCING GLUCOSE ISOMERASE
4064008 - GELATIN EXTRACTION
4080259 - PROCESS OF PREPARING L AND D ALPHA-AMINO ACIDS BY ENZYME TREATMENT OF DL-ALPHA-AMINO ACID AMIDE
4106991 - ENZYME GRANULATE COMPOSITION AND PROCESS FOR FORMING ENZYME GRANULATES
4110163 - BETA-GLUCANASE
4152211 - IRON CONTAINING CELL MASS GLUCOSE ISOMERASE PREPARATION
4266031 - PROTEASE PRODUCT OF REDUCED ALLERGENICITY

- ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING
- NOVO LABORATORIES, INCORPORATED
 4138290 - GLUCOSE ISOMERIZATION UNDER EXPANDED BED CONDITIONS
- NOVO TERAPEUTISK LABORATORIUM A/S
 3674633 - PROCESS FOR THE PRODUCTION OF URICASE
 3674643 - PREPARATION OF PROTEOLYTIC ENZYMES HAVING MAXIMUM ACTIVITY AT HIGH ALKALINITY
 3677902 - PREPARATION OF AMYLOGUCOSIDASE
 3723250 - PROTEOLYTIC ENZYMES, THEIR PRODUCTION AND USE
 3827938 - ENZYME PRODUCTS
 3950513 - PROCESS OF STABILIZING THERAPEUTICALLY USEFUL PLASMIN SOLUTIONS
 3988207 - PREPARATION OF A MILK-COAGULATING ENZYME
- ONO PHARMACEUTICAL COMPANY
 3475276 - METHOD OF PRODUCING URICASE FROM YEAST
 3862885 - DETERMINATION OF URIC ACID IN BLOOD WITH URICASE
 3862886 - PROCESS FOR PRODUCING CHOLESTEROL OXIDASE
 4003794 - METHOD FOR PURIFICATION OF PHYSIOLOGICALLY ACTIVE SUBSTANCE USING ENZYME-ENZYMES INHIBITOR SYSTEM
 4030577 - METHOD FOR PURIFICATION OF PHYSIOLOGICALLY ACTIVE SUBSTANCE USING ENZYME-ENZYMES INHIBITOR SYSTEM
- ORGANON, INC.
 3591388 - PURIFICATION OF MICROBIAL RENNETS
 3654090 - METHOD FOR THE DETERMINATION OF ANTIGENS AND ANTIBODIES
- ORIENTAL YEAST CO., LTD.
 3810823 - METHOD FOR ISOLATION OF ENZYMES
- OSCAR MAYER & CO., INC.
 3549501 - RECOVERY OF PEPsin FROM LININGS OF PIG STOMACHS
- OTSUKA PHARMACEUTICAL CO., LTD.
 3674646 - METHOD FOR MANUFACTURING PROTEASE
- OWENS-ILLINOIS, INC.
 4008126 - IMMOBILIZATION OF PROTEINS BY IN-SITU POLYMERIZATION
- OXFORD PAPER COMPANY
 3513072 - INACTIVATION OF ALPHA AMYLASE ENZYMES BY FLUOROSILICATE COMPOUNDS
- PABST BREWING COMPANY
 3594278 - PREPARATION OF POLYNUCLEOTIDES
 3607653 - BACTERIAL PROTEASE COMPOSITIONS AND PROCESS FOR PREPARING THEM
 3607658 - BACTERIAL PROTEASES AND BACTERIAL AMYLASE COMPOSITIONS
 3700581 - RECOVERY OF ENZYMES
 3717550 - LIQUID COMPOSITIONS OF BACTERIAL PROTEASE AND/OR AMYLASE AND PREPARATION THEREOF
 3737376 - NON-DUSTING AND MOISTURE-RESISTANT ENZYME COMPOSITIONS
 3741901 - WASHING COMPOSITIONS AND PROCESS
 3795586 - RECOVERY OF ENZYMES
 4247633 - REAGENT FOR COLORIMETRIC DETERMINATION OF CREATIVE PHOSPHOKINASE
- PARKE DAVIS & COMPANY
 4055718 - 9-(2-O-ACYL-BETA-D-ARABINOFURANOSYL)-ADENINE COMPOUNDS AND METHOD FOR THEIR PRODUCTION
- PAULS & SANDARS, LIMITED
 3708002 - MALTING OF DEHUSKED GRAIN
- PENICK & FORD LIMITED
 4014743 - METHOD FOR CONTINUOUS PREPARATION OF COOKED THINNED STARCH PASTES

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

PENICK + FORO LIMITED (CONTINUED)

4029546 - COLUMN APPARATUS AND PROCESS FOR IMMOBILIZED ENZYME REACTIONS

PENNALT CORPORATION

4116772 - FREE-FLOWING FUNGAL ENZYME COMPOSITION

PENTAPHARM A. G.

3849252 - ENZYME COMPOSITION AND PROCESS FOR THE MANUFACTURE THEREOF

4070245 - SUBSTRATE FOR THE QUANTITATIVE DETERMINATION OF PROTEOLYTIC ENZYMES

4137127 - PROCESS FOR THE PREPARATION OF THROMBIN-LIKE ENZYMES FROM SNAKE VENOMS

PFEIFER + LANGEN

3969538 - RECOVERY OF ENZYMES WITH ION EXCHANGERS

4111714 - PROCESS FOR OBTAINING AMINO ACIDS FROM THE RAW JUICES OF SUGAR MANUFACTURE

PFIZER INC.

3753860 - PRESERVATION OF BOVINE STOMACHS FOR RENNIN EXTRACTION

3766015 - PRESERVATION OF BOVINE STOMACHS FOR RENNIN EXTRACTION

3770587 - CHEMICALLY MODIFIED PROTEOLYTIC ENZYMES

PHARMEXBIO A. G.

3468760 - METHOD FOR OBTAINING UROKINASE

PHILIP MORRIS INCORPORATED

3636097 - ISOLATION OF MALIC ACID FROM TOBACCO

PIERCE CHEMICAL COMPANY

4002531 - MODIFYING ENZYMES WITH POLYETHYLENE GLYCOL AND PRODUCT PRODUCED THEREBY

PILLSBURY COMPANY

3423288 - PROCESS FOR PREPARING GENTIOBIOSIDE

PRESIDENT AND FELLOWS OF HARVARD COLLEGE

4111751 - METHOD OF PURIFYING ALCOHOL DEHYDROGENASE

4137127 - METHOD OF PURIFYING ALCOHOL DEHYDROGENASE AND AFFINITY RESIN THEREFOR

PROCTER + GAMBLE COMPANY

3451935 - GRANULAR ENZYME-CONTAINING LAUNDRY COMPOSITION

3557002 - STABILIZED AQUEOUS ENZYME PREPARATION

3558498 - GRANULAR DETERGENT COMPOSITION CONTAINING ENZYMES AND ENVIRONMENTAL CONTROL COMPONENTS

3560392 - DETERGENT COMPOSITIONS CONTAINING ENZYME- STABILIZING COLLAGEN-DERIVED PROTEINS

3574120 - HIGHLY ALKALINE DETERGENT COMPOSITION CONTAINING AN ENZYME DERIVED FROM THERMOPHILIC STREPTOMYCES RECTUS VAR. PROTEOLYTI
CUS

3627683 - DETERGENT COMPOSITION

3627688 - STABILIZED AQUEOUS ENZYME CONTAINING COMPOSITIONS

3629262 - STABILIZED AQUEOUS ENZYME CONTAINING AMYLOLYTIC ENZYMES

3631766 - DETERGENT COMPOSITIONS CONTAINING STABILIZED ALPHA-AMYLASE

3661786 - DETERGENT COMPOSITIONS CONTAINING STABILIZED ENZYME ELABORATED BY THERMOACTINOMYCES VULGARIS ATCC 15734

3707504 - PROCESS OF PRODUCING ENZYME COMPOSITIONS

3749671 - PREVENTION OF ENZYME DEACTIVATION BY CHLORINE

3755085 - DETERGENT COMPOSITION CONTAINING ENZYMES

3773674 - STABILIZED AQUEOUS ENZYME COMPOSITIONS

3819528 - STABILIZATION AND ENHANCEMENT OF ENZYMIC ACTIVITY

3944470 - DETERGENT COMPOSITIONS CONTAINING ENZYMES

3985686 - STABILIZATION AND ENHANCEMENT OF ENZYMIC ACTIVITY

4011169 - STABILIZATION AND ENHANCEMENT OF ENZYMIC ACTIVITY

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

PROJEKTIERUNG CHEMISCHE VERFAHRESTECHNIK GMBH
4275159 - PROCESS FOR THE PRODUCTION OF XYLIDSE BY ENZYMATIC HYDROLYSIS OF XYLAN

PROSPA S.A.
4202884 - DERIVATIVE OF LYSOZYME

RADIOCHEMICAL CENTRE LIMITED
4062733 - RADIO-ASSAY OF DESTROGEN

RAND LABORATORIES, INC.
3650903 - METHOD OF PRODUCTION OF FIBRINOLYTIC MATERIAL
3755083 - METHOD FOR RECOVERING URONINASE FROM URINE CONTAINING THE SAME

RESEARCH CORPORATION
3522346 - NINTHROMEDGENIC MICROCAPSULES
3692631 - METHOD FOR BACTERIAL PROTEINASE
3766167 - ORALLY ACTIVE ANTI-COAGULANT
3768200 - APPARATUS FOR THE PRODUCTION OF ALGAE INDICATING A FILTERING MACHINE
3790446 - CYTODHAGA ISOMYLASE
3860483 - NOVEL METHOD OF DIAGNOSIS OF SCHISTOSOMIASIS AND REAGENTS THEREFOR
4071408 - NEURAMINIDASE
4108726 - SARCOIDOSIS TEST
4116770 - WAXY BARLEY STARCH WITH UNIQUE SELF-LIQUEFYING PROPERTIES

RESEARCH FOUNDATION FOR MICROBIAL DISEASES OF OSAKA UNIVERSITY
3912594 - METHOD OF PRODUCING DEXTRANS

RESEARCH FOUNDATION OF CHILDREN S HOSPITAL
4067776 - METHOD FOR DIFFERENTIAL DIAGNOSIS OF MENINGITIS WITH A LIMULUS LYSATE TEST

RESEARCH PRODUCTS REHODVT LTD.
4251631 - CROSS-LINKED ENZYME MEMBRANE

RESEARCH TRIANGLE INSTITUTE
4053644 - PROCESS OF REMOVING THE COOKED FLAVOR FROM MILK
4087328 - PURIFICATION AND IMMOBILIZATION OF SULFHYDRYL OXIDASE

RHONE-POULENC INDUSTRIES
3941657 - PURIFICATION OF D-AMINODIOL DIOXIDE
4288556 - MICROORGANISM AND PROTEOLYTIC ENZYME DERIVED THEREFROM

RHONE-POULENC S.A.
3753970 - CYCLOPEPTIDES DERIVED FROM POLYMYXINS AND THEIR PREPARATION
3875005 - THROMBOLYTIC AND FIBRINOLYTIC ENZYME FROM STREPTOMYCES
3875006 - PROTEOLYTIC ENZYME FROM STREPTOMYCES HYDROSCOPICUS
3905113 - NEW AMYLASE AND ITS PREPARATION BY FERMENTATION OF A PENICILLIUM

RIKAGAKU, KENKYUSHO
3846145 - NOVEL AMYLASE AND PROCESS FOR PREPARING THE SAME
3923690 - NOVEL AMYLASE AND PROCESS FOR PREPARING THE SAME
3923598 - PROCESS FOR PRODUCING CYCLODEXTRINS
3956064 - DEOXYRIBONUCLEASE AND PROCESS FOR ITS PREPARATION
4052262 - PREPARATION OF AN ALKALINE PROTEASE
4080261 - NOVEL ENDONUCLEASE AND PROCESS FOR PRODUCTION THEREOF
4125977 - PROCESS FOR PRODUCTION OF CYCLODEXTRIN
4161424 - NOVEL ENDONUCLEASE AND PROCESS FOR PRODUCTION THEREOF

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

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RIKAGAKU, KENYUSHO

4259446 - PROCESS FOR PREPARATION OF DEOXYRIBONUCLEASES

RIKER LABORATORIES, INC.

4286064 - PROCESS FOR ISOLATING ACTIVE DEBRIDING AGENT FROM BROMELAIN

R. J. REYNOLDS TOBACCO COMPANY

3645848 - PROCESS OF PREPARING GLUCOSE ISOMERASE
 3935068 - CONTINUOUS ISOMERIZATION PROCESS UTILIZING IMMOBILIZED FLOCCULATE ENZYME
 3989597 - AGGREGATE OF FLOCCULATED CELLS
 3989597 - AGGREGATE OF FLOCCULATED CELLS
 4060456 - GLUCOSE ISOMERIZATION PROCESS
 4061539 - PREPARATION AND USE OF GLUCOSE ISOMERASE
 4179335 - THERMOSTABLE LACTASE DERIVED FROM +I BACILLUS COAGULANS

ROBERTSHAW CONTROLS COMPANY

4106995 - MICROORGANISM GROWTH INHIBITOR DEVICE

ROCKEFELLER UNIVERSITY

4245051 - HUMAN SERUM PLASMINOGEN ACTIVATOR

ROHM AND HAAS COMPANY

3649456 - SEPARATION OF POLYPEPTIDE SUBSTANCES WITH MACRORETICULAR RESINS
 3816259 - THERMOSTABLE LACTASE
 4010073 - FREE-FLOWING ENZYME COMPOSITION
 4233405 - PROCESS FOR SPRAY DRYING ENZYMES

ROHM G.M.B.H. CHEMISCHE FABRIK

4247643 - PREPARATION OF STABILIZED CARRIER-BOUND PROTEINS

ROUETTE FRERES

3890300 - STARCH HYDROLYSATE METHODS FOR ITS PREPARATION AND PRODUCTS BASED THEREON

ROUSSEL-UCLAF

3661715 - PROCESS FOR THE PREPARATION OF PROTEASES ACTIVE IN ALKALINE MEDIUM
 3741872 - PROCESS FOR PURIFYING ENZYMES OF THE ASPARAGINASE-TYPE

SAGAMI CHEMICAL RESEARCH CENTER

4119493 - PROCESS FOR PRODUCING A PEPTIDE
 4212945 - PROCESS FOR RECOVERING PROTEASE

SANDOZ LTD.

4061538 - ENZYMATICALLY OXIDIZING INTERFERON

SANKYO COMPANY LIMITED

3702805 - PROCESS FOR THE PRODUCTION OF A DEXTRAN-DEGRADING ENZYME
 3985521 - STOPPING AGENTS FOR ENZYME REACTIONS OF DEHYDROGENASE SYSTEMS

SANRAKU-OCEAN CO., LTD.

3622489 - PRODUCTION OF A NEW PROTEASE
 3622489 - PRODUCTION OF A NEW PROTEASE
 4152209 - NUCLEOTIDE PYROPHOSPHOTRANSFERASE AND METHOD OF PREPARATION

SCHERING AKTIENGESSELLSCHAFT

3987159 - STABLE SENSITIZED ERYTHROCYTES AND PREPARATION MEANS

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

SCHERING CORPORATION

3455968 - 9ALPHA-HALOGENO-11BETA-AZIDO-STERIODS AND METHODS FOR THEIR MANUFACTURE

SCHWARZ BIORESEARCH, INC.

3459637 - ENZYME DIGESTION OF NUCLEIC ACIDS

SEIKAGAKU KOGYO CO., LTD.

3549500 - NOVEL CHONORITINASE AND METHOD OF ITS RECOVERY

3994782 - METHODS FOR EXTRACTING AND PURIFYING KALLIDINGENASE

4038141 - METHODS FOR EXTRACTING AND PURIFYING KALLIDINGENASE

SHIONOGI & CO. LTD.

3915801 - PROCESS FOR PREPARING 6-AMINOPENICILLANIC ACID

3925195 - PREPARATION OF 6-AMINOPENICILLANIC ACID 1-OXIDE

3926728 - NEW PROCESS FOR THE PREPARATION OF 6-AMINOPENICILLANIC ACID

4073687 - ENZYMATIC ACYLATION TO AFFORD BETA-LACTAM ANTIBIOTICS

SMITHKLINE CORPORATION

4104379 - SUBSTITUTED 1-ALKYLTHIOPHENYL-2,3,4,5-TETRAHYDRO-1H-3-BENZAZEPINE COMPOUNDS

SNAM PROGETTI S.P.A.

4008363 - PROCESS FOR THE PREPARATION OF ADENINE DERIVATIVES MADE FUNCTIONAL AND PRODUCTS OBTAINED THEREFROM

4065353 - METHOD FOR THE PREPARATION OF O-CARBAMYL AMINODIACIDS AND THE CORRESPONDING D-AMINODIACIDS

4086539 - MACROMOLECULAR ADENINE NUCLEOTIDE DERIVATIVES

4086539 - MACROMOLECULAR ADENINE NUCLEOTIDE DERIVATIVES

4248704 - PHENYLALANINE AMMONIA LYASE OCCULDED FIBERS FOR REDUCING PHENYLALANINE BLOOD-LEVEL

4248967 - ENZYMIC COMPLEXES ADAPTED TO CONVERT RACEMIC HYDANTOINS INTO OPTICALLY ACTIVE AMINDIACIDS, AND THEIR APPLICATIONS

4250253 - COMPOSITION ADAPTED FOR THE DETERMINATION OF TRI-iodo THYRONINE AND DIAGNOSIS METHOD EMPLOYING SAME

4291123 - PRODUCTION OF FRUCTOSE AND FRUCTOSE-BASE SYRUPS AND MEANS FOR CARRYING OUT SUCH PRODUCTION

SOCIETA ITALIANA RESINE S.I.R. S.P.A.

3813319 - PROCESS FOR THE MANUFACTURE OF PROTEASES

3898133 - PROCESS OF PREPARING AN ENZYME WITH LIPOLYTIC ACTIVITY

SOCIETE ANONYME LES PRODUITS ORGANIQUES DU

3705085 - METHOD FOR EXTRACTING AND SEPARATING ENZYMES

SOCIETE ANONYME ROURE BERTRAND DUPONT

4055564 - INTERMEDIATES USEFUL FOR THE PRODUCTION OF NORPATCHOULENOL

SOCIETE D ASSISTANCE TECHNIQUE POUR PRODUITS NESTLE S.A.

3852478 - MILK-CLOTTING ENZYME

3966555 - ALPHA-GALACTOSIDASE PRODUCTION

4081330 - PRODUCTION OF A MILKCURLING ENZYME

SOCIETE D ETUDES ET D APPLICATIONS BIOCHIMIQUES AND

3620923 - URATE OXIDASE AND PROCESS FOR THE PRODUCTION THEREOF

3810820 - URATE OXIDASE AND PROCESS FOR THE PRODUCTION THEREOF

SOCIETE RAPTOUSE S.A.

3623936 - PREPARATION OF MICROBIAL ALKALINE PROTEASE BY FERMENTATION WITH BACILLUS SUBTILIS, VARIETY LICHENIFORMIS

SFA-SOCIETA PRODOTTI ANTIBIOTICI S.P.A.

3515643 - PROCESS FOR THE PRODUCTION OF LYSOZYME

3586607 - PROCESS FOR THE RECOVERY AND PURIFICATION OF LYSOZYME

3937815 - LYSOZYME DERIVATIVES

ORGANIZATIONAL PATENTING (1/69-12/81) - ALPHA LISTING

SRI INTERNATIONAL

4243752 - PRODUCTION OF INCREASED YIELDS OF CELLULOLYTIC ENZYMES FROM +1 THIELAVIA TERRESTRIS +B AND SEPARATING METHODS THEREFOR

STAMICARBON B.V.

4247645 - PROCESS FOR REMOVING MELAMINE FROM MELAMINE-CONTAINING LIQUIDS

STANDARD BRANDS INCORPORATED

3524768 - ISOLIZATION OF ALPHA-AMYLASE PREPARATIONS
 3624795 - METHOD FOR ISOMERIZING GLUCOSE SYRUPS
 3623953 - PROCESS FOR PREPARING DEXTROSE CONTAINING SYRUPS
 3630845 - ALPHA PURIFICATION OF AMYLASE
 3642582 - PRODUCTION OF GLUCOAMYLASE
 3660236 - PROCESS FOR GROWING MICROORGANISMS
 3666628 - PROCESS FOR ISOMERIZING GLUCOSE TO FRUCTOSE
 3694314 - ENZYME TREATMENT
 3725202 - PROCESS FOR GROWING MICROORGANISMS
 3736232 - PROCESS FOR GROWING MICROORGANISMS CONTAINING FRUCTOSE
 3784409 - PROCESS FOR ENZYMICALLY ISOMERIZING GLUCOSE TO FRUCTOSE
 3834940 - METHOD OF REFINING AN ENZYMICALLY PRODUCED FRUCTOSE-CONTAINING SOLUTION
 4001083 - PROCESS FOR PRODUCING ISOAMYLASE
 4001084 - PROCESS FOR PRODUCING DEXTROSE
 4011137 - PROCESS FOR PRODUCING DEXTROSE USING MIXED IMMOBILIZED ENZYMES
 4011139 - PROCESS FOR PRODUCING ALPHA-1,6 GLUCOSIDASES USING THERMOPHILIC MICROORGANISMS
 4089745 - PROCESS FOR ENZYMICALLY CONVERTING CELLULOSE DERIVED FROM CORN HULLS TO GLUCOSE

STANFORD RESEARCH INSTITUTE

4081328 - PRODUCTION OF CELLULASE BY A THERMOPHILIC THIELAVIA TERRESTRIS

STANFORD UNIVERSITY, LELAND JUNIOR, THE BOARD OF TRUSTEES OF

4237224 - PROCESS FOR PRODUCING BIOLOGICALLY FUNCTIONAL MOLECULAR CHIMERAS

SUMITOMO CHEMICAL COMPANY, LIMITED

4147592 - PURIFICATION OF UROKINASE
 4189350 - PROCESS FOR PURIFYING UROKINASE
 4244943 - METHOD FOR PREPARING UROKINASE INJECTION
 4259521 - METHOD FOR ISOLATION OF GLUCOSE ISOMERASE

SWIFT & COMPANY

3702718 - PROCESS OF PURIFYING BROMELAIN
 3798208 - MODIFICATION OF PROTEIN WITH ETHYLENIMINE
 4001480 - ENCAPSULATION PROCESS UTILIZING MICROORGANISMS AND PRODUCTS PRODUCED THEREBY
 4024285 - PROCESS FOR PREPARING PLANT PROTEASE SOLUTIONS

SYNTEX (U.S.A.) INC.

3880934 - NITROPHENYLOXY-BUTANEOLIDS
 4070453 - DIPLOID PORCINE EMBRYONIC CELL STRAINS, CULTURES PRODUCED THEREFROM, AND USE OF SAID CULTURES FOR PRODUCTION OF VACCINES

SYVA COMPANY

3690634 - LIQUID DETERMINATION WITH SPIN LABELED COMPOUNDS BY RECEPTOR DISPLACEMENT
 3704711 - ENZYME AMPLIFICATION ASSAY
 3852157 - COMPOUNDS FOR ENZYME AMPLIFICATION ASSAY
 3867366 - OPTATE IMIDATES AND PROTEIN CONJUGATES THEREOF
 3875011 - ENZYME IMMUNOASSAYS WITH GLUCOSE-6-PHOSPHATE DEHYDROGENASE
 3878187 - POLYPEPTIDE DERIVATIVES OF AMPHETAMINE AND ANALOGS FOR IMMUNODIAGNOSIS
 3880715 - IMMUNODIAGNOSIS FOR HAPTENS

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

SYVA COMPANY	(CONTINUED)
3884898	- NORNORPHINE DERIVATIVES BONDED TO PROTEINS
3917581	- CONJUGATES TO ENZYMES
3917582	- ISOTHIOCYANATE AND THIUREA DERIVATIVES OF BENZOYL ECGONINE CONJUGATED TO POLYPEPTIDES
3935074	- ANTIBODY STERIC HINDRANCE IMMUNOASSAY WITH TWO ANTIBODIES
3966556	- COMPOUNDS FOR ENZYME AMPLIFICATION ASSAY METHADONE ANALOGS
3975237	- COMPOUNDS FOR ENZYME AMPLIFICATION ASSAY - - ECGONINE ANALOGS
4039385	- CARDIAC GLYCOSIDE ENZYME CONJUGATES
4040907	- IODOETHYRINONE ENZYME CONJUGATES
4043872	- POLYDIODOTHYRINONE IMMUNOASSAY
4054520	- NON-OXO-CARBONYL CONTAINING BENZOYL ECGONINE AND COCAINE COMPOUNDS POLYPEPTIDE AND DERIVATIVES THEREOF
4066636	- DIAZEPAM ENZYMES CONJUGATES
4088511	- TETRACETAM ANTIGENS AND ANTIBODIES
4085354	- LYSOZYME CONJUGATES FOR ENZYME IMMUNOASSAYS
4085355	- LYSOZYME CONJUGATES FOR ENZYME IMMUNOASSAYS
4089105	- LIDOCAINE ANTIGENS AND ANTIBODIES
4121975	- PRETREATMENT OF SAMPLES FOR POLYDIODOTHYRINONE ASSAYS
4130462	- RECEPTOR STERIC HINDRANCE IMMUNOASSAY FOR RECEPTOR DETERMINATION
4171244	- ENZYME-BOUND-POLYDIODOTHYRINONE
4191613	- MALATE DEHYDROGENASE CONJUGATES FOR ENZYME IMMUNOASSAYS
4193983	- LABELED LIPOSOME PARTICLE COMPOSITIONS AND IMMUNOASSAYS THEREWITH
4203802	- INHIBITABLE ENZYME AMPLIFICATION ASSAY
4220722	- METHOD FOR CONJUGATING TO POLYAMINO COMPOUNDS EMPLOYING HALOACYL GROUPS AND COMPOSITIONS PREPARED THEREBY
4230805	- THEOPHYLLINE ANTIGENS AND ANTIBODIES
4233401	- ANTENZYMES HOMOGENEOUS COMPETITIVE BINDING ASSAY
4233402	- ANTIBODY ANTIGEN CONJUGATES AND ANTIBODIES
4233477	- PROPANOL ANTIGEN CONJUGATES AND ANTIBODIES
4262089	- THEOPHYLLINE ANTIGENS AND ANTIBODIES
4275160	- IMPRAMINE DERIVATIVES AND POLY(AMINO ACID) CONJUGATES
4281061	- DOUBLE ANTIBODY FOR ENHANCED SENSITIVITY IN IMMUNOASSAY
4281065	- PHENCYCLIDINE CONJUGATES TO ANTIGENIC PROTEINS AND ENZYMES
4282325	- ENZYME BOUND CORTICOSTEROIDS
4287300	- CHARGE EFFECTS IN ENZYME IMMUNOASSAYS
4288553	- DISOPYRAMIDE COMPOUNDS FOR CONJUGATING PROTEINS USED IN IMMUNOASSAYS FOR DISOPYRAMIDE
TAISHO PHARMACEUTICAL CO., LTD	
3652400	- PROCESS FOR THE PREPARATION OF AMYLASE
3911111	- ENZYME INHIBITOR SPECIFIC AGAINST THIOL PROTEASE AND PROCESS FOR PRODUCTION THEREOF
TAKEDA CHEMICAL INDUSTRIES LTD.	
3443969	- METHOD FOR PREPARING CONJUGATES FROM YEASTS
3515642	- METHOD FOR PREPARING A STABILIZED ENZYME COMPOSITION
3649454	- BACTERIOLYTIC ENZYME AND PROCESS FOR THE PRODUCTION THEREOF
3652399	- ALKALI PROTEASE
3660564	- INTERFERON INDUCTION
3691014	- METHOD FOR PRODUCING PROTEASE
3749642	- METHOD FOR THE PRODUCTION OF AMINOPENICILLINS
3798128	- METHOD FOR THE PRODUCTION OF GRANULAR ENZYME PREPARATION
3816253	- PREPARATION OF GRANULAR ENZYME PREPARATION
3933790	- PHOSPHORYLYXOSTASIN
3945888	- METHOD FOR THE PRODUCTION OF CEPHALOSPORINS
4014860	- PLASMINOSTREPTIN (ENZYME INHIBITOR) AND METHOD FOR PRODUCING IT FROM STREPTOMYCIN
4075405	- BETA-1,3-GLUCAN DERIVATIVES

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

TANABE SEIYAKU CO. LTD.

- 3484255 - PREVENTION OF CLOUTING OF SYRUP IN WHICH CANNED ORANGE SEGMENTS ARE PRESERVED
- 3652402 - ASPARAGINASE HAVING ANTI-TUMOR ACTIVITY AND PROCESS FOR PREPARING THE SAME
- 3720383 - ENZYMIC PREPARATION OF L-CITRULLINE
- 3751926 - PROCESS FOR THE PRODUCTION OF L-ASPARTIC ACID
- 3881127 - PROCESS FOR PREPARING URACANIC ACID
- 3901763 - METHOD FOR PREPARING URACANIC ACID
- 4090419 - WATER-INSOLUBLE TANNIN PREPARATION FOR IMMOBILIZATION OF PROTEINS
- 4160597 - METHOD FOR PURIFICATION OF CRUDE UROKINASE

TECHNICON INSTRUMENTS CORPORATION

- 4194067 - PROCESS FOR THE PURIFICATION OF CARBOHYDRATE CONTAINING ENZYMES
- 4206286 - IMMOBILIZATION OF PROTEINS ON INORGANIC SUPPORTS

TEMPLE UNIVERSITY

- 3674645 - KERATINOLYTIC ENZYME ISOLATED FROM TRICHOPHYTON MENTAGORPHYTES AND PROCESS THEREFOR
- 3793149 - CELL-BOUND KERATINOLYTIC ENZYMES OF TRICHOPHYTON MENTAGORPHYTES AND PROCESS THEREFOR

THE UNIVERSITY OF WATERLOO

- 3975236 - FERMENTATION PROCESSES FOR MAKING PENICILLIN AND CELLULOSE

TOHO PHARMACEUTICAL INDUSTRIES CO., LTD.

- 4252902 - PROCESS FOR PURIFICATION OF CRUDE KALLIKREIN

TOKUYAMA SODA KABUSHIKI KAISHA

- 4010072 - PROCESS FOR PREPARING L-TARTARIC ACID
- 4017362 - MICROBIOLOGICAL PROCESS FOR PREPARING L-TARTARIC ACID IN PRESENCE OF SURFACTANTS

TOKYO TANABE COMPANY, LIMITED

- 3919049 - PROCESS FOR PREPARING BETA-GALACTOSIDASE

TOWNSEND AND TOWNSEND

- 3781212 - AEROSOL ENZYME DETERGENTS STABILIZED WITH CARBON DIOXIDE

TOYO BOSEKI KABUSHIKI KAISHA

- 3431176 - PREPARATION OF URICASE
- 4301244 - QUANTITATIVE ANALYSIS OF FREE FATTY ACID AND REAGENT COMPOSITION THEREFOR

TOYO JOZO COMPANY, LTD.

- 3649455 - PRODUCTION OF LIPASE
- 3737383 - PROCESS FOR PRODUCTION OF ENZYME ALKALINE DEXTRANSASE
- 3761354 - PROCESS FOR THE PRODUCTION OF CEPHALEXIN
- 3830000 - ENZYME FOR PRODUCTION OF CEPHALEXIN
- 3901763 - METHOD FOR THE PURIFICATION OF CEPHALOSPORANIC ACID
- 3909360 - PROCESS FOR PRODUCING INSOLUBILIZED ENZYME
- 3915798 - PROCESS FOR PRODUCING 7-AMINO DESACETOXY CEPHALOSPORANIC ACID
- 3960662 - PROCESS FOR THE PRODUCTION OF 7-AMINO-CEPHEM COMPOUNDS
- 4125980 - CHOLINE OXIDASE
- 4216292 - PROCESS FOR THE PRODUCTION OF SARCOSINE OXIDASE
- 4237222 - LACTATE OXIDASE PROCESS FOR THE MANUFACTURE THEREOF AND ANALYTICAL METHOD AND KIT FOR THE USE OF THE SAME
- 4237227 - SULFATE COMPOUNDS OF A CARRIER, HAVING S+13 S EXCHANGE REACTIVITY
- 4246342 - PROCESS FOR THE MANUFACTURE OF PYRUVATE OXIDASE, AND ANALYTICAL METHOD AND KIT FOR THE USE OF THE SAME
- 4275161 - PROCESS FOR THE MANUFACTURE OF L-ALPHA-GLYCEROPHOSPHATE OXIDASE

ENZYMES PER SE

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

TOYO SODA MANUFACTURING CO., LTD.
4212946 - PROCESS FOR RECOVERING PROTEASE

TRUSTEES OF TUFTS COLLEGE
4078972 - METHOD OF PURIFICATION OF CARBOXYPEPTIDASE G/1

TWYFORD LABORATORIES LIMITED
3711376 - COAGULANTS

UNILEVER N.V.
3579425 - PREPARATION OF PROSTAGLANDINS

UNITED BRANDS COMPANY
3440143 - METHOD OF PREPARING ENZYMES FROM PLANT TISSUES CONTAINING PHENOLS

UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND. -
3711376 - PRODUCTION OF L-ASPARAGINASE
3843445 - ASPARAGINASE PRODUCTION

UNITED STATES OF AMERICA, AGRICULTURE
3562113 - RAPID MICROBIOLOGICAL PRODUCTION OF ALPHA- GALACTOSIDASE
3583884 - ENZYME PREPARATION OF HESPERETIN DIHYDROCHALCONE GLUCOSIDE
3589982 - PRODUCTION OF L-ASPARAGINASE
3725085 - FLAVOR ENHANCEMENT OF ALLIUM PRODUCTS
3729379 - HYDROXY-CONJUGATED FATTY ACIDS
3736231 - PREPARATION OF INSOLUBILIZED ENZYMES
3869345 - LIMONATE DEHYDROGENASE AND PREPARATION THEREOF
3917512 - LIMONATE-NAD (P) OXIDOREDUCTASE

UNITED STATES OF AMERICA, ARMY
3764475 - ENZYMIC HYDROLYSIS OF CELLULOSE TO SOLUBLE SUGARS
4275163 - CELLULASE-PRODUCING MICROORGANISM

UNITED STATES OF AMERICA, DEPARTMENT OF ENERGY
3972775 - CONVERSION OF CELLULOSIC MATERIALS TO SUGAR

UNITED STATES OF AMERICA HEALTH EDUCATION AND WELFARE, WESNE
3910822 - ISOLATION OF GLUCOCEREBROSIDASE FROM HUMAN PLACENTAL TISSUE
3912595 - METHOD OF PURIFYING ENZYMES USING BORONIC ACIDS COVALENTLY BONDED TO AN INSOLUBLE SUPPORT
4275057 - SEVEN-MEMBERED RING COMPOUNDS AS INHIBITORS OF CYTIDINE DEAMINASE

UNITED STATES OF AMERICA, INTERIOR
4113567 - INSOLUBILIZATION OF ENZYMES ON MODIFIED PHENOLIC POLYMERS

UNITED STATES OF AMERICA, NATIONAL AERONAUTICS AND SPACE ADM
3423290 - LYOPHILIZED REACTION MIXTURES
3437560 - USE OF THE ENZYME HEXOKINASE FOR THE REDUCTION OF INHERENT LIGHT LEVELS
3660240 - FLAVIN CO-ENZYME ASSAY
3745089 - PROTEIN STERILIZATION METHOD OF FIREFLY LUCIFERASE USING REDUCED PRESSURE AND MOLECULAR SIEVES

UNITED STATES OF AMERICA, NAVY
4068506 - METHOD OF SEPARATING AND PURIFYING TWO ACTIVE FORMS OF URKINASE USING AFFINITY CHROMATOGRAPHY
4069106 - IMMOBILIZATION OF ENZYMES ON KERATIN

UNITED STATES OF AMERICA
4001087 - AFFINITY LABELLING ENZYMES WITH ESTERS OF AROMATIC SULFONIC ACIDS

ENZYMES PER SE

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

- UNITIKA LTD.
4273873 - PREPARATION OF ANTITHROMBOGENIC POLYMERIC MATERIALS
- UNIVERSITY OF ALABAMA IN BIRMINGHAM MEDICAL AND EDUCATIONAL
4022667 - SUBSTRATE SOLUTION FOR CARBOXYLIC ESTER HYDROLASE DETERMINATION
4071407 - NOVEL MALTASE ENZYME PRODUCED BY A NEW YEAST STRAIN
4081326 - A METHOD FOR REMOVING MALTOTETRAOSE AND LOWER SACCHARIDES FROM SOLUTION
- UNIVERSITY OF ARKANSAS FOUNDATION
4220721 - METHOD FOR ENZYME REUTILIZATION
- UNIVERSITY OF CALIFORNIA, THE REGENTS OF
3749843 - MEASUREMENT OF URINARY D(-)VANILLYLMADELIC ACID
3817830 - METHOD FOR OBTAINING OPTICALLY ACTIVE COMPOSITION FROM RACEMATE OF VANILLYLMADELIC ACID
4007283 - PRODUCTION AND UTILIZATION OF LACTASE
- UNIVERSITY OF DELAWARE
4172763 - PREPARATION OF HIGH PURITY XANTHINE OXIDASE FROM BOVINE MILK
4238566 - XANTHINE OXIDASE
- UNIVERSITY OF EDINBURGH
3875004 - ENZYMIC PROCESS FOR PRODUCING PROSTAGLANDINS C
4058664 - PROSTAGLANDIN C/3
- UNIVERSITY OF ILLINOIS FOUNDATION
3444041 - IN VITRO SYNTHESIS OF RIBONUCLEIC ACIDS AND ENZYME THEREFOR
3444042 - INTERFERENCE WITH BIOLOGICAL ACTS
3444043 - INTERFERENCE WITH BIOLOGICALLY ACTIVE RNA FORMATION
3444044 - REPLICATION OF MUTANT NUCLEIC ACIDS
3661993 - SYNTHESIS IN VITRO OF NUCLEIC ACIDS AND PRODUCTS USED THEREIN AND PRODUCTS PRODUCED THEREFROM
3689475 - SYNTHESIZED MUTANT RNA AND METHODS OF PREPARING SAME
- UNIVERSITY OF MINNESOTA, THE REGENTS OF
3510402 - NONDISCRIMINATING PROTEINASE AND THE PRODUCTION THEREOF
- UNIVERSITY OF PENNSYLVANIA
4165258 - PLASMINOGEN ACTIVATING ENZYME-SPECIFIC COMPETITIVE INHIBITOR
- UNIVERSITY OF SOUTHERN CALIFORNIA
3959074 - SERUM CARDIAC GLYCOSIDE ASSAY
3959077 - ENZYME PREPARATION FOR SERUM CARDIAC GLYCOSIDE ASSAY
- UNIVERSITY OF VIRGINIA
3849254 - PROCESS FOR EFFECTING ENZYMIC REACTIONS IN AEROSOLS
4038144 - METHOD OF INCREASING FERMENTATION YIELDS
- UNIVERSITY OF WATERLOO
4025394 - FERMENTATION PROCESSES USING SCRAPPED TUBULAR FERMENTOR
- UDF INC.
4237231 - METHOD OF PURIFYING GLUCOSE ISOMERASE AND A COMPOSITION FOR STORING SAME
4250263 - METHOD OF PURIFICATION OF THERMALLY STABLE ENZYMES
4256658 - METHOD OF PURIFICATION OF GLUCOSE ISOMERASE

ORGANIZATIONAL PATENTING (1/59-12/81) - - ALPHA LISTING

- UPJOHN COMPANY
 3740318 - COMPOSITION OF MATTER AND PROCESS
 3761356 - PROCESS FOR PRODUCING AN ESTERASE
 4043870 - PROCESS OF PURIFYING CHOLESTEROL OXIDASE
 4088537 - DELTA 1 / DEHYDROGENATION OF CORTICOSTEROIDS WITHOUT SIDE CHAIN DEGRADATION BY SEPTOMYXA
 4091204 - PROCESS FOR RECOVERING LINCOMYCIN FROM FERMENTATION BEER
 4242456 - RADIOENZYMATIC ASSAY OF CATECHOLAMINES
 4284587 - RADIOENZYMATIC ASSAY OF CATECHOLAMINES
 4285542 - RADIOENZYMATIC ASSAY OF CATECHOLAMINES
 VELISCOL CHEMICAL CORPORATION
 3556946 - MALTING PROCESS
 3556946 - MALTING PROCESS
 WARNER-LAMBERT COMPANY
 4212941 - METHOD FOR THE PRODUCTION OF 9-(2-O-ACYL-+62 -O-ARABINOFURANSYL)ADENINE COMPOUNDS
 WASHINGTON UNIVERSITY
 4267271 - RADIOIMMUNOASSAY FOR ISOENZYMES OF CREATIVE KINASE HAVING A B-SUBUNIT AND REAGENTS THEREFOR
 WILLIAM ZINSSER + CO.
 4067773 - ENZYME-CONTAINING ARTICLE FOR REMOVING PAPER ADHERED TO A SURFACE
 4092175 - METHOD OF REMOVING PAPER ADHERED TO A SURFACE
 WISCONSIN ALUMNI RESEARCH FOUNDATION
 4103006 - GLYCOSIDES OF 2,6-BIS(HYDROXY-PHENYL)-3,7-DIOXABICYCLO [3.3.0] OCTANE
 WITCO CHEMICAL CORPORATION
 3697451 - STABLE ENZYME CONTAINING LIQUID DETERGENT
 WORTHINGTON BIOCHEMICAL CORPORATION
 3440142 - PRODUCTION OF ASPARAGINASE
 3823071 - PROSTATIC ACID PHOSPHATASE DETERMINATION
 W. R. GRACE + CO.
 3668448 - METHOD FOR BLOAT CONTROL
 3898131 - ENZYME FOR TREATMENT AND PREVENTION OF BLOAT
 XEROX CORPORATION
 3746622 - COMPOSITION AND PROCESS
 3860484 - ENZYME STABILIZATION
 4020268 - AGAROSE CONTAINING AFFINITY MATRIX MATERIALS
 YAMANOUCHI PHARMACEUTICAL CO., LTD.
 4242449 - 7-METHOXY CEPHALOSPORINS AND PROCESS OF PRODUCING THEM
 4242449 - 7-METHOXY CEPHALOSPORINS AND PROCESS OF PRODUCING THEM
 YAMASA SHUJI KABUSHIKI KAISHA
 3779867 - PRODUCTION OF POLYNUCLEOTIDES
 3849249 - PRODUCTION OF SYNTHETIC POLYNUCLEOTIDES
 3930955 - PROCESS FOR PRODUCING PTERIN DEAMINASES HAVING ANTITUMOR ACTIVITY
 4224407 - ASSAY OF L-LYSINE
 4234691 - L-LYSINE +60 -OXIDASE
 YEDA RESEARCH AND DEVELOPMENT CO., LTD.
 3627640 - ENZYME PURIFICATION AND DECOLORIZATION
 3850749 - PREPARATION OF OLIGORIBONUCLEOTIDES

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

YELLOW SPRINGS INSTRUMENT COMPANY, INC.

3979274 - MEMBRANE FOR ENZYME ELECTRODES

ZAIJAN HOJIN BISEIBUTSU KAGAKU KENKYU KAI

3840516 - BIOLOGICALLY ACTIVE SUBSTANCE, PEPTASTIN AND PRODUCTION PROCESSES THEREOF

3973608 - MICROBIAL PRODUCTION OF CERTAIN ISOFLAVONES

3974184 - MICROBIAL PRODUCTION OF CERTAIN ISOFLAVONES

4209488 - PROCESS FOR PRODUCING NEW ANTITUMOR ANTHRACYCLINE ANTIBIOTICS

4219622 - PROCESS FOR PRODUCING ANTIBIOTICS MA 144-M+HO 1 +B AND MA 144-M+HO 2

ZELLSLOFFABRIK WALOHOF A.G.

3516907 - METHOD FOR PRODUCING 5'-MONONUCLEOTIDES

ZERIA-SHINYAKU KOGYO KABUSHIKI KAISHA

428030 - UROKINASE PREPARATION FOR ORAL ADMINISTRATION

Z-L LIMITED PARTNERSHIP

4234577 - ERGOSTADIENTRIOLS, COMPOSITIONS CONTAINING SAME, AND METHODS OF PREPARING AND USING SAME

ENZYMES PER SE - PART 2D

INVENTORS OF INDIVIDUALLY OWNED PATENTS (1/75-12/81) (ALPHA LISTING)

INVENTOR NAME	STREET	CITY	ST	ZIP/CNTRY	PAGE D
AKPAROV	VALERY K.	ULITSA LUGOVAYA, 33, KV. 26		SU	
4264738 -	PROCESS FOR PURIFICATION OF PROTEOLYTIC ENZYMES	FRYZAZINO, MOSKOVSKOI			
ALI	MAJID	19 EDMONT PL.	NJ	07666	
4256833 -	ENZYME IMMUNOASSAY FOR ALLERGIC DISORDERS	TEANECK			
BARENKO	JULIA SEMENOVNA	ULITSA GOGOLYA, 27A, KV. 35		SU	
3963577 -	LYTIC ENZYME AND METHOD OF PREPARING SAME	DNEPROPETROVSK			
BASHKOVICH	ALEXANDR PAVLOVICH	PROSPEKT M. TOREZA, 40, KORPUS		SU	
4086503 -	ENZYME OF HYDROLYTIC ACTION, ENZYMATIC PREPARATION, METHOD FOR PREPARING BOTH AND THEIR USES	LENINGRAD			
4075322 -	ENZYME COMPOSITION				
BASTIN	MICHEL F.	4551 TOUR PANORAMIQUE		FR	
3989848 -	METHOD OF WASHING FOR THE PRODUCTION OF WORT AND APPARATUS FOR THE CARRYING OUT OF THIS PROCESS	54100 NANCY			
BECKER	MILTON J.	2925 W. JEROME	IL	60645	
4007008 -	PREPARATION OF REFERENCE SERUM FROM ANIMAL BLOOD	CHICAGO			
BELOUSOV	ANATOLY A.	SOSINSKAYA ULITSA, 6, KV. 46		SU	
4286062 -	PROCESS FOR PRODUCING AN ENZYME PREPARATION TO TENDERIZE MEAT PRODUCTS	MOSCOW			
BERDELLE-HILGE	PHILIPP	125 HIGH ST.	MA	02110	
3878301 -	PROCESS FOR CONTROLLING THE PRODUCTIVITY OF MICRO-ORGANISMS	BOSTON			
BJORKSTEN	JOHAN	4601 FISH HATCHERY RD., RT. 4	WI	53711	
3860485 -	PREPARATION OF OLIGOMERS OF MICROENZYMES	MADISON			
BLUMBERG	SHMARYAHU	C/O BIOPHYSICS RESEARCH LABORA	MA	02111	
3886042 -	ACYLATION OF PROTEOLYTIC ENZYMES	BOSTON			
BRANNER-JORGENSEN	SVEN	24 JOHANNEVEJ		DK	
4255454 -	THERMAL DESTABILIZATION OF MICROBIAL RENNET				
CHUNG	ALFRED	8781 SW. 87TH ST.	FL	33173	
4260682 -	HIGH SENSITIVITY ASSAYS FOR ANGIOTENSIN CONVERTING ENZYME	MIAMI			
4276378 -	HIGH SENSITIVITY ASSAYS FOR ANGIOTENSIN CONVERTING ENZYME				
CORY	CYNTHIA S.	R.R. NO. 6 P.O. BOX 67	IN	46122	
4077842 -	STABILIZED GLUCOSE ISOMERASE ENZYME CONCENTRATE	DANVILLE			
CORY	ROBERT PAUL	R.R. NO. 6 P.O. BOX 67	IL		
4077842 -	STABILIZED GLUCOSE ISOMERASE ENZYME CONCENTRATE	LA GRANGE			
COULTHARD	JOHN LOUIS	LOT 9, FRANKSTON RD.		AU	
3981803 -	METHOD AND APPARATUS FOR ANAEROBIC FERMENTATION	CRANBOURNE SOUTH, 39			
GRAVEN	DAVID BARRY	18 EVERSLEY PARK, STORETON RD.		EN	
3904478 -	IMMOBILIZED CO-ENZYMES	OXTON, BIRKENHEAD. C			
DE SALVO	WALTER ANTHONY	237 PROSPECT AVE.	NJ	07032	
3859854 -	ENZYMATIC DETERGENT	NORTH ARLINGTON			

INVENTORS OF INDIVIDUALLY OWNED PATENTS (1/75-12/81)

(ALPHA LISTING)

INVENTOR NAME	STREET	CITY	ST	ZIP/CNTRY
DEAN 3904478 - IMMobilized CO-ENZYMES 4011205 - ENZYME SEPARATION 4011377 - ENZYME SEPARATION 4012293 - ENZYME SEPARATION 4012568 - ENZYME SEPARATION 4012569 - ENZYME SEPARATION 4012570 - ENZYME SEPARATION 4012571 - ENZYME SEPARATION 4012572 - ENZYME SEPARATION	DUNCAN 43 REDGATE	FORMBY, LANCASHIRE		EN
EL-SAYED 4237003 - PROCESS FOR BIOLOGICAL PURIFICATION OF LIQUID WASTES	REFAAT NASRUDALSHAG	ZABY	SE	
FAYEMI 4256833 - ENZYME IMMUNOASSAY FOR ALLERGIC DISORDERS	ALFRED 15 FRANCINE CT.	WHITE PLAINS	NY	10607
FISHMAN 3940317 - METHOD OF ISOLATION OF LYSOZYME	LOUIS 143 N. GROVE ST.	VALLEY STREAM	NY	11580
GAIDA 4264738 - PROCESS FOR PURIFICATION OF PROTEOLYTIC ENZYMES	ANATOLY V. 300RDZHYV PRDEZD, 5 KORPUS 2,	MOSCOW	SU	
GAY 3958015 - PURIFIED PLANT PROTEIN CONCENTRATE	MAX M. 24, RUE DE BRUXELLES A 67/	STRASBOURG (BAS-RHIN)	FR	
GRIFFON 3975553 - DEPROTEINIZATION OF YEAST CELLS	HENRI 2 PLACE MAZAS	75012 PARIS	FR	
GRIGORIEV 3963577 - LYTC ENZYME AND METHOD OF PREPARING SAME	EVGENY FEDOROVIC ULITS DARYINA, 40, KV. 1	DNEPRPETROVSK	SU	
GRINBERG 4066503 - ENZYME OF HYDROLYTIC ACTION, ENZYMIC PREPARATION, METHOD FOR PREPARING BOTH AND THEIR USES	GRIGORY EFIMOVICH PROSPEKT METALLISTOV, 82, KV.	LENINGRAD	SU	
4075322 - ENZYME COMPOSITION				
HALL 4225672 - METHOD FOR PRODUCING MALTOOLIGOSACCHARIDE GLYCOSIDES	LED M. 406 DEVON DR.	HOMWOOD	AL	35209
HENRY 4049496 - RAPID SEPARATION OF PLASMA CREATINE KINASE ISOENZYMES	PHILIP D. 832 BRICKEN	KIRKWOOD	MD	63122
HOLMQUIST 3886042 - ACYLATION OF PROTEOLYTIC ENZYMES	HARTON C/O BIOPHYSICS RESEARCH LABORA	BOSTON	MA	02111
HUCK 4226854 - DEBRIDEMENT OF DEVITALIZED TISSUE WITH HYDROLYTIC ENZYME PRODUCT	JOHN C. 96-08 70TH AVE.	WASHINGTON	DC	
KATZ 3940317 - METHOD OF ISOLATION OF LYSOZYME	FRIEDRICH D. 42 STEVENS ST.	NEW YORK	NY	11375
KENNEY 3858954 - ENZYMIC DETERGENT	EDWARD JOSEPH	BERNARDSVILLE	NJ	07924

ENZYMES PER SE		INVENTORS OF INDIVIDUALLY OWNED PATENTS (1/75-12/81)		(ALPHA LISTING)		PAGE 0
INVENTOR NAME	STREET	CITY	ST	ZIP/CNTRY		
KHARASCH 3982999 -	JEROME A. COMPLEXING CRESOLASE WITH COPPER CHELATING AGENTS	NILES	IL	60648		
KING 4086140 -	JOHN BURNHAM PROCESS FOR ISOLATING FIBRINOLYTIC SUBSTANCES	RONDEBOSCH, CAPE	ZA			
KING 4039658 -	JOHN BURNHAM FIBRINOLYTIC SUBSTANCES	RONDEBOSCH, CAPE	ZA			
KLEIN 4197291 -	GEROLD K. HYDROLYTIC ENZYME MATERIAL	BRUNSWICK	ME	04011		
4226854 -	DEBRITEMENT OF DEVALIZED TISSUE WITH HYDROLYTIC ENZYME PRODUCT					
KUHLMEY 3992364 -	WALTER PHYSIOLOGICALLY ACTIVE POLYPEPTIDE PREPARATION	28 BREMEN, SCHWACHHA	OT			
KULBAKH 4065503 -	VALTER OSVALDOVI ENZYME OF HYDROLYTIC ACTION, ENZYMIC PREPARATION, METHOD FOR PREPARING BOTH AND THEIR USES	LENINGRAD	SU			
4075322 -	ENZYME COMPOSITION					
LEVY 3940317 -	MILTON METHOD OF ISOLATION OF LYSOZYME	NEW YORK	NY	11104		
LINE 4007008 -	WILLIAM F. PREPARATION OF REFERENCE SERUM FROM ANIMAL BLOOD	RIVER FOREST	IL	60305		
LONGENECKER 4302536 -	ROBERT W. COLORIMETRIC IMMUNOASSAY PROCESS	MIAMI	FL	33156		
LOWE 4012570 -	CHRISTOPHER ROBIN ENZYME SEPARATION	MAIDENHEAD, BERKSHIR	EN			
LOWE 4011205 -	CHRISTOPHER ROBIN ENZYME SEPARATION	MAIDENHEAD, BERKSHIR	EN			
4011377 -	ENZYME SEPARATION					
4012283 -	ENZYME SEPARATION					
4012568 -	ENZYME SEPARATION					
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4012571 -	ENZYME SEPARATION					
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WATER 4104029 -	CHARLES L. JR. PROCEDURE FOR THE ASSAY OF PHARMACOLOGICALLY IMMUNOLOGICALLY AND BIOCHEMICALLY ACTIVE COMPOUNDS IN BIOLOGICAL FLUIDS	YARDELY	PA	19067		
MALKI 4062730 -	YRJO PROCEDURE FOR PRODUCING ENZYMES	HELSINKI	SF			
MANOHV 4286062 -	NIKOLAI D. PROCESS FOR PRODUCING AN ENZYME PREPARATION TO TENDERIZE MEAT PRODUCTS	ROSTOV-NA-DONU	SU			
MANN 4232124 -	GEORGE F. METHOD OF PRODUCING PLASMINOGEN ACTIVATOR	LONDON	GB			

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INVENTOR NAME	STREET	CITY				
MARKKANEN	PERTTI	VANTAA				SF
4062730 -	PROCEDURE FOR PRODUCING ENZYMES					
MARTINI	ALESSANDRO					IT
4141791 -	MILK COAGULATING MICROBIAL ENZYME	FRAZIONE PONTE S. GI				SF
MATTESSON	RAIMOND	HELSINKI				10510
4062730 -	PROCEDURE FOR PRODUCING ENZYMES	BRIARCLIFF MANDR				IR
MESA-TEJADA	RICARDO	42 JUNIPER PL.				93010
4256833 -	ENZYMES IMMUNDASSAY FOR ALLERGIC DISORDERS					
MODABEER	FARROKH Z.	TEHERAN				93010
3988115 -	DIAGNOSTIC METHOD FOR DETERMINING PATHOLOGICAL CONDITION BY ANTIGEN-COMBINING CAPACITY OF LYMPHOCYTES	CAMARILLO				CA
4250254 -	STABILIZED LIQUID ENZYME AND COENZYME COMPOSITIONS	1043 MESA DR.				
4271264 -	STABILIZED LIQUID ENZYME AND COENZYME COMPOSITIONS					
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4282316 -	STABILIZED ENZYMIC SOLUTIONS FOR DETERMINING UREA					
MODROVICH	E.					
4153511 -	STABILIZED LIQUID COENZYME COMPOSITIONS	591 BEVERLY DR.				93010
MOLL	MANFRED					FR
3989848 -	METHOD OF WASHING FOR THE PRODUCTION OF WORT AND APPARATUS FOR THE CARRYING OUT OF THIS PROCESS	13TER RUE DE HOUEMONT				
NALERBUFT	DONALD	89 LAKE SHORE DR.				07436
4256833 -	ENZYMES IMMUNDASSAY FOR ALLERGIC DISORDERS					
NORIMOTO	YUJI	1-2, KYOMA-CHO				JA
3920519 -	ENZYMATIC HYDROLYSIS OF RIBONUCLEIC ACID					
DHIMIRA	SHIGERU	543, NEGUYA				JA
3920519 -	ENZYMATIC HYDROLYSIS OF RIBONUCLEIC ACID					
PETERS	BRUNO	8 RUE DES BATELEURS				FR
3989848 -	METHOD OF WASHING FOR THE PRODUCTION OF WORT AND APPARATUS FOR THE CARRYING OUT OF THIS PROCESS					
POLATOVSHAYA	OLGA GRIGORIEV	ULITSA UCHITELSKAYA, 19, KORPU				SU
4066503 -	ENZYMES OF HYDROLYTIC ACTION, ENZYMIC PREPARATION, METHOD FOR PREPARING BOTH AND THEIR USES					
POLATOVSKAYA	OLGA GRIGORIEV	ULITSA UCHITELSKAYA, 19, KORPU				SU
4075322 -	ENZYMES COMPOSITION					
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4075322 -	ENZYMES COMPOSITION					
PRONINA	MARIA IVANOVNA	ULITSA SEDOVA, 109, KV. 33				SU
4066503 -	ENZYMES OF HYDROLYTIC ACTION, ENZYMIC PREPARATION, METHOD FOR PREPARING BOTH AND THEIR USES					

INVENTORS OF INDIVIDUALLY OWNED PATENTS (1/75-12/81) (ALPHA LISTING)

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PRONINA 4075322 - ENZYME COMPOSITION	IVANOVNA	LENINGRAD	SU	10032
DAMANARAYANAN 4256833 - ENZYME IMMUNOASSAY FOR ALLERGIC DISORDERS	100 HAVEN AVE.	NEW YORK	NY	10032
RIVKINA-PEVTSOVA 4066503 - ENZYME OF HYDROLYTIC ACTION, ENZYME PREPARATION, METHOD FOR PREPARING BOTH AND THEIR USES	IONOVNA	LENINGRAD	SU	10032
4075322 - ENZYME COMPOSITION				
ROTMAN 4002532 - ENZYME CONJUGATES	BORIS	PROVIDENCE	RI	02906
ROUHTAINEN 4062730 - PROCEDURE FOR PRODUCING ENZYMES	LEO	HELSINKI	SF	
RUDESKAYA 4264738 - PROCESS FOR PURIFICATION OF PROTEOLYTIC ENZYMES	GALINA N.	MOSCOW	SU	
RUDESKAYA 4100028 - METHOD FOR PURIFICATION OF PROTEOLYTIC ENZYMES	GALINA NIKOLAEVN	MOSCOW	SU	
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SCOTT 3979522 - BIOCHEMICAL PROCESS FOR THE SYNTHESIS OF PROTEIN FROM CELLULOSE AND STARCH-CONTAINING PLANTS	HENRY L.	TUSCULA	IL	61953
SEVASTYANOV 4286062 - PROCESS FOR PRODUCING AN ENZYME PREPARATION TO TENDERIZE MEAT PRODUCTS	BORIS A.	MOSCOW	SU	
SHILOV 4286062 - PROCESS FOR PRODUCING AN ENZYME PREPARATION	G.	PROSPEKT LENINA, 121, KV. 56	SU	
SHIMIZU 3920519 - ENZYME HYDROLYSIS OF RIBONUCLEIC ACID	YOSHITAKI	1188, SHIMOTOGARI, NAGAIZUMI-C	JA	
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SLAONE 3884760 - PRODUCTION OF UROKINASE	NATHAN H.	1842 BROOKSIDE DR.	TN	38038
STEKOLNIKOV 4286062 - PROCESS FOR PRODUCING AN ENZYME PREPARATION	LEONID I.	LIPETSKAYA ULITS, 26, KV. 13	SU	
STEPANOV 4264738 - PROCESS FOR PURIFICATION OF PROTEOLYTIC ENZYMES	VALENTIN M.	ULITSA CHERTANOVSKAYA, 35, KV.	SU	

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INVENTOR NAME	STREET	CITY			
STEPANOV 4100028 - METHOD FOR PURIFICATION OF PROTEOLYTIC ENZYMES	VALENTIN MIKHAILOV ULITSA CHERTANOVSKAYA, 33. KOR	MOSCOW		SU	
TATANO 3920519 - ENZYMIC HYDROLYSIS OF RIBONUCLEIC ACID	TOSHIO 1188, SHIMOTOGARI, NAGAIZUMI-C	SUNTO, SHIZUOKA		JA	
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VINKO 4205130 - METHOD OF PURIFICATION OF HUMAN PROSTATIC ACID PHOSPHATASE	PIRKKO JAAKONKUJA 1 E 3	90230 OULU 23		FI	
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ZIMNIKHOVA 4066503 - ENZYME OF HYDROLYTIC ACTION, ENZYMIC PREPARATION, METHOD FOR PREPARING BOTH AND THEIR USES	EUGENIA SEMENOVNA ULITSA PIONERSTROYA, 18, KV. 2	LENINGRAD		SU	
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3446626 - METHOD FOR PREPARING A BROMELAIN SOLUTION FOR ANTE-MORTEM INJECTION					
3446706 - PROCESS FOR PRODUCING PALAT PROTEASES					
3455787 - PROCESS FOR EXTRACTING BROMELAIN					
3489964 - PERIPHERAL VASODILATOR PEPTIDE OBTAINED FROM THE ANIMALS OF THE FAMILY OTARIOIDE AND A METHOD OF PREPARING THE SAME					
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3575864 - STABILIZED PROTEASE OF BACTERIAL ORIGIN AND METHOD OF STABILIZING SUCH PROTEASE					
3592734 - PROCESS FOR CONVERTING STARCH AND OTHER POLYSACCHARIDES INTO DEXTROSE AND MALTOSE CONTAINING PRODUCTS					
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3657071 - FRACTIONATION OF PROTEINS					

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FRONT PAGES OF SELECTED PATENTS

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United States Patent

[11] 4,323,651
[45] Apr. 6, 1982

Long et al.

- [54] THERMOSTABLE LACTASE DERIVED FROM BACILLUS
- [75] Inventor: Margaret E. Long, Chin K. Lee, both of Winston-Salem, N.C.
- [73] Assignee: R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

[*] Notice: The portion of the term of this patent subsequent to Dec. 18, 1986, has been abandoned.

[21] Appl. No.: 93,169
[22] Filed: Oct. 2, 1980

Related U.S. Application Data

[60] Continuation of Ser. No. 61,668, Aug. 6, 1979, abandoned, which is a division of Ser. No. 66,094, Feb. 23, 1978, Pat. No. 4,197,135, which is a continuation-in-part of Ser. No. 35,363, Dec. 19, 1973.

[51] Int. Cl. C12N 9/08, C12N 1/20
[52] U.S. Cl. 435/207; 435/253;
435/632

[58] Field of Search 435/207; 253, 632

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4,007,283 2/1977 Cina et al. 435/207
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- P. J. Avanza, Biochimica et Biophysica Acta, 89, 495-502 (1984).
- Wierzbicki et al., Journal of Dairy Science, vol. 56(1), 26-32 (1973).

Primary Examiner—Lionel M. Shapiro
Attorney, Agent, or Firm—Neuman, Williams, Anderson & Olson

ABSTRACT

A thermostable lactase is obtained by cultivation of a number of the genus *Bacillus* in a suitable nutrient medium. The lactase is purified and is a free enzyme, the free enzyme is useful for the hydrolysis of lactose in a variety of substrate media.

4 Claims, No Drawings

United States Patent

[11] 4,326,029
[45] Apr. 20, 1982

Yukawa et al.

- [54] PROCESS FOR PRODUCTION OF LASPARTIC ACID
- [75] Inventor: Hisakazu Yokawa, Tetsuaki Nara, Yoshitomo Takayama, all of Bunkai, Japan
- [73] Assignee: Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

[21] Appl. No.: 177,044
[22] Filed: Aug. 11, 1980

Foreign Application Priority Data

Aug. 10, 1979 [JP] Japan 54/101620

[51] Int. Cl. C12P 13/20
[52] U.S. Cl. 435/233; 435/640

[58] Field of Search 435/109; 172, 116, 322

- [56] References Cited
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- Primary Examiner—Lionel M. Shapiro
Attorney, Agent, or Firm—Sughrue, Mion, Zinn, Macpeak and Seas

ABSTRACT

A process for producing L-aspartic acid economically and in a high yield is disclosed. L-aspartic acid, ammonium or an ammonium salt using a cultured product obtained by aerobically culturing a microorganism belonging to the genus *Brevibacterium* and having resistance to α -amino- β -hydroxy acid.

2 Claims, No Drawings

United States Patent

[11] 4,325,832
[45] Apr. 20, 1982

Loudbeck

- [54] ENZYME REFERENCE COMPOSITION
- [75] Inventor: Allan L. Loudbeck, Temple City, Calif.
- [73] Assignee: Beckman Instruments, Inc., Fullerton, Calif.

[21] Appl. No.: 114,009
[22] Filed: Jan. 21, 1980

Related U.S. Application Data

Continuation-in-part of Ser. No. 17,871, Mar. 5, 1979, abandoned.

[60] Ser. No. 0019,301,6, 09/96, 5/80
[61] Int. Cl. 435/16, 435/15, 435/16
[62] U.S. Cl. 435/16, 435/15, 435/16
[63] 435/17; 435/18; 435/19; 435/20; 435/21;
435/22; 435/24; 435/25; 435/26; 435/28
[64] 435/2; 435/3; 435/4; 435/5; 435/6; 435/7;
435/8; 435/9; 435/10; 435/11; 435/12; 435/13;
435/14; 435/15; 435/16; 435/17; 435/18; 435/19; 435/20; 435/21;
435/22; 435/24; 435/25; 435/26; 435/28

[58] Field of Search 435/16, 435/15, 435/16, 435/17, 435/18, 435/19, 435/20, 435/21, 435/22, 435/24, 435/25, 435/26, 435/28, 435/2; 435/3; 435/4; 435/5; 435/6; 435/7; 435/8; 435/9; 435/10; 435/11; 435/12; 435/13; 435/14; 435/15; 435/16; 435/17; 435/18; 435/19; 435/20; 435/21; 435/22; 435/24; 435/25; 435/26; 435/28

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Henry et al., *Clinical Chemistry, Principles and Techniques*, 2nd Ed., Harper & Rowe, New York, N. Y., pp. 774-778, (1974).

Primary Examiner—Teddy S. Gron
Attorney, Agent, or Firm—J. Steinmeyer, J. E. Vetterhagen, Robert S. Stein

ABSTRACT

A stable enzyme reference composition having an exact amount of known activity of at least one enzyme of known value; about 20 to about 40 weight percent of at least one alkylene polyol having from 2 to 5 carbon atoms; about 3 to about 8 grams (gm) per deciliter (dl) total protein present in a human serum sample; and about 60 to about 80 weight percent water.

12 Claims, No Drawings

United States Patent

[11] 4,326,033
[45] Apr. 20, 1982

Holleman et al.

- [54] MODIFIED UROKINASE HAVING EXTENDED ACTIVITY AND METHOD OF MAKING

[75] Inventor: William H. Holleman; Shaw-Guang Lee, both of Libertyville; Paul P. Wang, Waukegan, all of Ill.

[73] Assignee: Abbott Laboratories, North Chicago, Ill.

[21] Appl. No.: 146,823
[22] Filed: May 5, 1980

[60] Ser. No. CIN 9/40, CIN 9/72
[61] Int. Cl. 435/212, 435/215
[62] U.S. Cl. 435/212, 435/215
[63] 435/212; 435/215; 435/216; 435/217; 435/218; 435/219; 435/220; 435/221; 435/222; 435/223; 435/224; 435/225; 435/226; 435/227; 435/228; 435/229; 435/230; 435/231; 435/232; 435/233; 435/234; 435/235; 435/236; 435/237; 435/238; 435/239; 435/240; 435/241; 435/242; 435/243; 435/244; 435/245; 435/246; 435/247; 435/248; 435/249; 435/250; 435/251; 435/252; 435/253; 435/254; 435/255; 435/256; 435/257; 435/258; 435/259; 435/260; 435/261; 435/262; 435/263; 435/264; 435/265; 435/266; 435/267; 435/268; 435/269; 435/270; 435/271; 435/272; 435/273; 435/274; 435/275; 435/276; 435/277; 435/278; 435/279; 435/280; 435/281; 435/282; 435/283; 435/284; 435/285; 435/286; 435/287; 435/288; 435/289; 435/290; 435/291; 435/292; 435/293; 435/294; 435/295; 435/296; 435/297; 435/298; 435/299; 435/300; 435/301; 435/302; 435/303; 435/304; 435/305; 435/306; 435/307; 435/308; 435/309; 435/310; 435/311; 435/312; 435/313; 435/314; 435/315; 435/316; 435/317; 435/318; 435/319; 435/320; 435/321; 435/322; 435/323; 435/324; 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Yagi et al.

PROCESS FOR PRODUCING CYCLODEXTRINS

- [75] Inventors: Yoshiaki Yagi, Fujiwara, Kiyoshi Kato, Tokyo, Japn; Tadao Ogata, Chigasaki, Japan
[73] Assignee: Sanwa-Ocean Co., Ltd., Tokyo, Japan

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[58] Field of Search: 435/97, 435/193

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Primary Examiner—Elihu M. Jordan and Hamburg

Attorney, Agent, or Firm—Jernigan

ABSTRACT

A process for producing cyclodextrins which comprises using cultured medium of the strains belonging to genus *Micrococcus*, filtrate thereof or enzyme preparation thereof, and cyclodextrinase to produce cyclodextrins. The rate of α -cyclodextrin to β -cyclodextrin can be drastically varied by regulating the condition of the reaction mixture. It is disclosed.

8 Claims, 5 Drawing Figures

United States Patent

[19] Horiguchi et al.

PRODUCTION OF PLASMINOGEN ACTIVATOR

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436/336; 436/337; 436/338; 436/339; 436/340; 436/341; 436/342; 436/343; 436/344; 436/345; 436/346; 436/347; 436/348; 436/349; 436/350; 436/351; 436/352; 436/353; 436/354; 436/355; 436/356; 436/357; 436/358; 436/359; 436/360; 436/361; 436/362; 436/363; 436/364; 436/365; 436/366; 436/367; 436/368; 436/369; 436/370; 436/371; 436/372; 436/373; 436/374; 436/375; 436/376; 436/377; 436/378; 436/379; 436/380; 436/381; 436/382; 436/383; 436/384; 436/385; 436/386; 436/387; 436/388; 436/389; 436/390; 436/391; 436/392; 436/393; 436/394; 436/395; 436/396; 436/397; 436/398; 436/399; 436/400; 436/401; 436/402; 436/403; 436/404; 436/405; 436/406; 436/407; 436/408; 436/409; 436/410; 436/411; 436/412; 436/413; 436/414; 436/415; 436/416; 436/417; 436/418; 436/419; 436/420; 436/421; 436/422; 436/423; 436/424; 436/425; 436/426; 436/427; 436/428; 43

United States Patent

Yoshida et al.

[11] 4,258,134

[45] Mar. 24, 1981

NOVEL HYALURONIDASE BNP-4231 AND PRODUCTION THEREOF

[75] Inventors: Keizo Yoshida, Itozaki, Takashi Fujii, Seimichi Hironaka, Kinoshita, Hiroaki Kikuchi, Hirochiro, all of Japan

[73] Assignee: Fujiwara Pharmaceutical Co., Ltd., Osaka, Japan

[21] Appl. No. 35,719

[22] Filed: May 3, 1979

[30] Foreign Application Priority Data

May 11, 1978 (JP) Japan 53/65313

[51] Int. Cl. C12N 9/26

[52] U.S. Cl. 435/201; 435/886

[58] Field of Search 435/201; 435/201

[56] Reference Cited

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4 Claims, 6 Drawing Figures

OTHER PUBLICATIONS

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Chemical Abstracts 62, 40357e, (1969).

Chemical Abstracts 62, 40357e, (1972).

Chemical Abstracts 76, 110084, (1972).

Chemical Abstracts 85, 76359z, (1976).

Primary Examiner—Lionel M. Shapiro

Attorney, Agent, or Firm—Ohno, Fisher, Spivak, McLaughlin & Miller

ABSTRACT

Hyaluronidase obtained from Streptomyces koganeensis has the following properties:

(a) Acts as an endo B-hexosaminidase

(b) Degrades hyaluronic acid but not chondroitin

(c) Optimum pH range 4.0-4.3

(d) Stable pH range 4.0-11.3

(e) Optimum temperature around 60° C.

(f) Stable at a temperature below 60° C.

(g) Stable against proteolytic enzymes

4 Claims, 6 Drawing Figures

United States Patent

Reich et al.

[19]

[45]

HUMAN SERUM PLASMINOGEN ACTIVATOR

[75] Inventors: Edward Reich, New York; Arshad Khan, New York; Richard Schramm, New York; all of N.Y.

[73] Assignee: Rockefeller University, New York, N.Y.

[21] Appl. No. 891,808

[22] Filed: Mar. 30, 1978

[51] Int. Cl. C12N 9/48; A61K 35/16

[52] U.S. Cl. 435/212; 260/112 B

[58] Field of Search 435/212; 260/112 B; 424/101; 435/212; 215

[56] Reference Cited

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3,904,480 9/1975 Hall et al. 260/112 B

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[11] 4,245,051

[45] Jan. 13, 1981

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Summaria et al., J. Biol. Chem., vol. 251, No. 18, (1976), pp. 5810-5813.

Laemmli, U. K., J. Mol. Biol. and Clin. Med., vol. 65, No. 5, (1965), 711-711.

Laemmli, U. K., J. Mol. Biol. and Clin. Med., vol. 65, No. 5, (1965), 711-711.

Converse et al., Science, vol. 189, (1975), pp. 469-472.

Primary Examiner—Lionel M. Shapiro

Attorney, Agent, or Firm—Haght, Koffel, Noble & Seltzer, New York

ABSTRACT

Human plasminogen activator and a corresponding activator has been isolated from human plasma, which is characterized in that it is a single, electrophoretically and immunologically homogeneous protein. The activator acts as a catalyst to initiate fibrinolysis in the presence of plasminogen and is therefore useful in controlling clotting which occurs, e.g. in venous thrombosis or arterial occlusion, and in the treatment of myocardial infarction and thrombotic disease. The protein can be used to provide a reservoir for *in vivo* half life and can be used to provide a reservoir for maintaining the fibrinolytic potential of blood.

4 Claims, No Drawings

United States Patent

Terada et al.

[11] 4,255,519

[45] Mar. 10, 1981

GLYCEROL OXIDASE AND PROCESS FOR THE PRODUCTION THEREOF

[75] Inventors: Osamu Terada, Takayuki Uwajima, both of Miechi, Hiroko Akita, Yokohama, all of Japan

[73] Assignee: Kyowa Hakko Kogyo Co., Ltd., Japan

[21] Appl. No. 59,101

[22] Filed: Jul. 19, 1979

[30] Foreign Application Priority Data

Jul. 21, 1978 (JP) Japan 53/68261

[51] Int. Cl. C12N 9/08; C01B 3/14

[52] U.S. Cl. 435/201; 435/201

[58] Field of Search 435/201; 435/201

4 Claims, 7 Drawing Figures

Reference Cited

PUBLICATIONS

Journal of General Microbiology (1973), vol. 107, pp. 289-296.

Annual Review of Microbiology, vol. 30, pp. 535-578, (1976).

Primary Examiner—Lionel M. Shapiro

Attorney, Agent, or Firm—Craig & Anonelli

ABSTRACT

Glycerol oxidase II is an oxidizing enzyme of glycerol by which glycerol is oxidized to dihydroxyacetone in the presence of oxygen to form hydroperoxide and glycerolaldehyde. This action of the present enzyme is the same as that of the enzyme glycerol oxidase I described in U.S. Pat. No. 3,983,347.

18, 1978. This enzyme has characteristic properties in substrate specificity, optimum and stable pH, optimum temperature for action, substrate affinity (Michaelis-Menten constant), and enzyme stability by heating and autoclaving.

4 Claims, 7 Drawing Figures

United States Patent

Gallo

[19]

[45]

CELLULOSE-PRODUCING MICROORGANISM

[75] Inventor: Benedict J. Gallo, Natick, Mass.

[73] Assignee: The United States of America as represented by the Secretary of the Army, Washington, D.C.

[21] Appl. No. 902,822

[22] Filed: Nov. 20, 1978

[51] Int. Cl. C12N 9/42; C12N 15/00

[52] U.S. Cl. 435/209; 435/209

[58] Field of Search 435/209; 435/209

[56] Reference Cited

U.S. PATENT DOCUMENTS

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3,732,775 8/1976 Heine et al. 435/209 X

FOREIGN PATENT DOCUMENTS

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[11] 4,275,163

[45] Jun. 23, 1981

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Montecorvo et al., Applied and Environmental Microbiology, vol. 34, pp. 777-782 (Dec. 1977).

Laemmli, U. K., J. Mol. Biol. and Clin. Med., vol. 21, pp. 152-154 (Jan. 1971).

Ladisch et al., Science, vol. 201, pp. 743-745 (Aug. 1978).

Primary Examiner—Lionel M. Shapiro

Attorney, Agent, or Firm—Nathan Edelberg, Robert P. O'Brien, Lawrence E. Lippman

ABSTRACT

A process and a microorganism for synthesizing cellulose are described. The microorganism is a mutant strain of an Ascomycete fungus capable of synthesizing cellulase. The synthesis of cellulase by the microorganism is induced by glucose, repressed by glucose but not induced by lactose. Furthermore, the combination of lactose with xylitol elicits maximum cellulase synthesis by the mutant.

7 Claims, 6 Drawing Figures

United States Patent

[10]

4,275,162

[11] [45] Jun. 23, 1981

Beppu et al.

[54] PROCESS FOR THE PRODUCTION OF SPHINGOMYELINASE

[75] Inventors: Tetsuhiko Beppu, No. 5-21, Ichome, Horinouchi, Sagami-ku, Yokohama, Japan; Nobuo Aida, Fujiwara, both of Japan

[73] Assignee: Chugoku Chemical Engineering & Construction Co., Ltd., Yokohama; Tetsuhiko Beppu, Tokyo, both of Japan

[21] Appl. No.: 126,202

[22] Filed: Mar. 3, 1980

[30] Foreign Application Priority Data

Mar. 5, 1979 [JP] Japan 54-2694

[51] Int. Cl. C12N 9/16

[52] U.S. Cl. 435/196; 435/197; 435/198

[56] Field of Search

435/194-198, 435/18, 19

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[58] PUBLICATIONS
Biochimica et Biophysica Acta, vol. 53, pp. 247-256 (1975).
Journal of Biochemistry, vol. 84, pp. 55-63 (1978), Tokyo.

Primary Examiner—Leonel M. Shapiro
Attorney, Agent, or Firm—Friedman, Holtz, Goodman & Woodward

ABSTRACT

A process for the production of sphingomyelinase comprising the steps of: (a) growing *Streptomyces* sp. in a culture medium, belonging to the genus *Pseudomonas*, in a culture medium and recovering sphingomyelinase from the culture medium.

9 Claims, No Drawings

United States Patent

[10]

4,266,031

[11] [45] May 5, 1981

Tang et al.

[54] PROTEASE PRODUCT OF REDUCED ALLERGENICITY

[75] Inventors: Peck Tang Gupta, C. Nidhan, both of India; Keith Gibbons, Verloose, Knud Astrup, Farum; Hans Schiff, Søborg, all of Denmark

[73] Assignee: Novo Industri A/S, Denmark

[21] Appl. No.: 54,555

[22] Filed: Jul. 3, 1979

[30] Foreign Application Priority Data

Jul. 4, 1978 [GB] United Kingdom 20771/78

[51] Int. Cl. C12N 9/06; C12N 9/26

[52] U.S. Cl. 435/188; 435/172; 435/173; 435/174

[58] Field of Search 435/172, 173, 188, 222, 435/231, 435/232, 435/233, 435/234

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6 Claims, 4 Drawing Figures

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126,765 2/1972 United Kingdom

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Methods in Enzymology, vol. 19, pp. 199-213 (1970), article by Ottesen et al. entitled "The Substrates."

Primary Examiner—Leonel M. Shapiro
Attorney, Agent, or Firm—Fidman, Wolfe & Waldron

ABSTRACT

A novel protease product suitable for admixture to washing compositions and exhibiting substantially all the properties of the parent protease, but which is free of strains of *Bacillus licheniformis* which have been mutated to block their synthesis of protease other than Subtilisin-like (a-subtilisin). The commercial *Bacillus licheniformis* strain is a non-serine protease of lower stability and greater allergenicity than subtilisin.

United States Patent

[10]

4,259,446

[11] [45] Mar. 31, 1981

Ando et al.

[54] PROCESS FOR PREPARATION OF DEOXYRIBONUCLEASES

[75] Inventors: Tadahiko Ando; Tadahiko Shibata, both of Tokyo; Eiji Hayase; Niza, Shikato Iwata, Wako, all of Japan

[73] Assignee: Rikagaku Kenkyusho, Wako, Japan

[21] Appl. No.: 58,802

[22] Filed: Jul. 19, 1979

[30] Foreign Application Priority Data

Jul. 28, 1978 [JP] Japan 53/190,000

[51] Int. Cl. C12N 9/23; C12N 15/00

[52] U.S. Cl. 435/199; 435/172

[58] Field of Search 435/199, 435/172

References Cited

U.S. PATENT DOCUMENTS
3,130,894 7/1964 Shiba et al.
4,002,481 7/1978 Ando et al.
4,181,424 7/1979 Ando et al.
Primary Examiner—Leonel M. Shapiro
Attorney, Agent, or Firm—Buckman and Archer

ABSTRACT

Disclosed is a process for the preparation of deoxyribonucleases (DNases) which comprise culturing a cell-free extract from cells obtained during a period ranging from the late logarithmic growth phase to the initial stage of the stationary growth phase, and separating the DNase from the cell-free extract by separation to obtain two or more DNase each of which possessing different substrate specificity.

5 Claims, No Drawings

United States Patent

[10]

4,259,447

[11] [45] Mar. 31, 1981

Hafeli

[54] PROCESS FOR THE PRODUCTION OF UROKINASE IN PURE CONDITION

[75] Inventor: Robert Hafeli, Zürich, Switzerland

[73] Assignee: Alpha Patent Limited, Tel-Aviv, Israel

[21] Appl. No.: 53,552

[22] Filed: Jun. 29, 1979

[30] Foreign Application Priority Data

Jun. 30, 1978 [CH] Switzerland 7197/78

[51] Int. Cl. C12N 9/72

[52] U.S. Cl. 435/215; 435/815

[58] Field of Search 435/215, 815

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Chemical Abstracts, vol. 87, reference 196465a (1977).
Chemical Abstracts, vol. 85, reference 103326 (1976).
Chemical Abstracts, vol. 86, reference 103394 (1976).
Primary Examiner—Leonel M. Shapiro
Attorney, Agent, or Firm—Cushman, Darby & Cushman

ABSTRACT

This is provided a process for the production of pure, concentrated urokinase starting from a crude urokinase solution. The crude urokinase solution is contacted in a medium having a pH of 8.0 with a porous solid matrix there is immobilized urokinase. Subsequently the urokinase adsorbed in this manner is eluted in an elution agent having a pH 5.4-5.5. There are obtained highly purified urokinase which is used as a pharmaceutical for the dissolving of fibrous clots and coagulants.

35 Claims, No Drawings

[11] 4,191,613

[45] Jun. 23, 1981

- Gner, Jr. et al.

- 43

U.S. PATENT DOCUMENTS

United States Patent [19]

[45] Sep. 2, 1980

- 2

- 2 K; 4

U.S. PATENT DOCUMENTS

- 100

3/1979 Richardson 195/

[11] 4,235,969

[45] Sep. 2, 1980

21: 424/85:

- 054/17

antibody
100 µg V

- 255

- [54] **PROTEASE INACTIVATED α -AMYLASE**
PATENT DOCUMENTS
 Inventors: Ronald W. Leach, Willowbrook, Ill.; Ronald Holsida, Naperville, Ill.
 Assignee: Ciba International Inc., Englewood Cliffs, N.J.
 Filed: Aug. 5, 1976
 Int. Cl. C12N 9/28
 U.S. Cl. 435/202, 435/813
 Field of Search 195/66 R, 68, 121, 122, 435/202
- [57] **ABSTRACT**
 Protease enzyme impurities contained in bacterial α -amylase preparations are inactivated by a mild heat treatment in the presence of a protective material. Useful protective materials include calcium and starch. The treated α -amylase can then be used to solubilize starch materials by various granular starch and conventional processes. Hydrolysates obtained contain conventionally less soluble protein than those prepared using untreated α -amylase. The α -amylase used in the process is one derived from a *Bacillus licheniformis* microorganism.
- 4 Claims, No Drawings

U.S. PATENT DOCUMENTS

- 3,683,642 6/1961 Bollen 195/66 R
 3,689,594 6/1962 Laney et al. 195/1
 3,340,514 7/1966 Bock 435/96
 3,301,102 2/1967 Amstutz 195/31 R

- [54] **PROTEASE INACTIVATED α -AMYLASE**
PATENT DOCUMENTS
 Inventors: Ronald W. Leach, Willowbrook, Ill.; Ronald Holsida, Naperville, Ill.
 Assignee: Ciba International Inc., Englewood Cliffs, N.J.
 Filed: Aug. 5, 1976
 Int. Cl. C12N 9/28
 U.S. Cl. 435/202, 435/813
 Field of Search 195/66 R, 68, 121, 122, 435/202
- [57] **ABSTRACT**
 Protease enzyme impurities contained in bacterial α -amylase preparations are inactivated by a mild heat treatment in the presence of a protective material. Useful protective materials include calcium and starch. The treated α -amylase can then be used to solubilize starch materials by various granular starch and conventional processes. Hydrolysates obtained contain conventionally less soluble protein than those prepared using untreated α -amylase. The α -amylase used in the process is one derived from a *Bacillus licheniformis* microorganism.
- 4 Claims, No Drawings

U.S. PATENT DOCUMENTS

- 3,683,642 6/1961 Bollen 195/66 R
 3,689,594 6/1962 Laney et al. 195/1
 3,340,514 7/1966 Bock 435/96
 3,301,102 2/1967 Amstutz 195/31 R

- [54] **METHOD OF PRODUCING PLASMINOGEN ACTIVATOR**
 Inventor: George F. Mann, 117 Vassar Rd., New Canaan, Conn., England, SE26
 Filed: Apr. 23, 1979
 Related U.S. Application Data
 Continuation of Ser. No. 839,433, Oct. 5, 1977, abandoned.
- [57] **ABSTRACT**
 Production of plasminogen activator from human diploid lung cells through cultivation in an aqueous nutrient medium containing an inducer of activator production.
- Localbanin hydrolysate is an active inducer, and is used in 0.1-1.0% w/v concentration in the medium.
- 6 Claims, No Drawings

U.S. PATENT DOCUMENTS

- 3,128,228 4/1964 Michl et al. 195/7.8
 3,090,945 1/1976 Lewin 195/7.1

- [54] **STABILIZATION OF PEROXIDASE**
 Inventors: Edgar C. De Paepe, Jean D. Weemen, Osa, all of Netherlands
 Assignee: Akzo Incorporated, Asheville, N.C.
 Notice: The portion of the term of this patent subsequent to Sep. 25, 1986, has been disclaimed.
- [21] Appl. No.: 6,934
 [22] Filed: Jan. 25, 1979
 [30] Continuation of Ser. No. 931,817, Sep. 9, 1977, Pat. No. 4,169,012.
- [57] **ABSTRACT**
 New and useful stable peroxidase compositions are disclosed which are particularly useful as reagents in enzyme immunoassay (EIA) tests. The novel peroxidase compositions contain polyvalent ions of groups 3 and 4 of the Periodic Table. These novel compositions are relatively invariable to freeze-drying. Preferably, the polyvalent ions selected are those of Al, Zn, Mg, Fe, and Cu.
- 12 Claims, No Drawings

Foreign Application Priority Data

- Sep. 24, 1976 [NL] Netherlands 76/0608
 [51] Int. Cl. C12N 9/28
 [52] U.S. Cl. C07C 7/02, C07C 31/14
 [53] Field of Search 195/61, 66, 103.5 R, 103.5 C, 435/186, 192, 1, 28

- [54] **METHOD OF STABILIZING α -GALACTOSIDASE**
 Inventors: Brooks M. Stein, Burlingame, James C. Linder, Loveland, both of Colo.
 Assignee: The Great Western Sugar Company, Denver, Colo.
 Filed: Feb. 23, 1979
- [57] **ABSTRACT**
 The activity of mycelial bound α -galactosidase is stabilized by treating α -galactosidase containing mycelia with about 5 to 25 percent by weight glutaraldehyde based upon the dry weight of the mycelia. The glutaraldehyde treated mycelia may be used in the hydrolysis of galactose containing substrates without incurring substantial α -galactosidase activity loss during hydrolysis.
- 5 Claims, No Drawings

References Cited

- 3,647,625 3/1972 Suzuki et al. 435/276

- [54] **PERIODIC TABLE OF ELEMENTS**
 Inventors: Edgar C. De Paepe, Jean D. Weemen, Osa, all of Netherlands
 Assignee: Akzo Incorporated, Asheville, N.C.
 Notice: The portion of the term of this patent subsequent to Sep. 25, 1986, has been disclaimed.
- [21] Appl. No.: 6,934
 [22] Filed: Jan. 25, 1979
 [30] Continuation of Ser. No. 931,817, Sep. 9, 1977, Pat. No. 4,169,012.
- [57] **ABSTRACT**
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- 12 Claims, No Drawings

Foreign Application Priority Data

- Sep. 24, 1976 [NL] Netherlands 76/0608
 [51] Int. Cl. C12N 9/28
 [52] U.S. Cl. C07C 7/02, C07C 31/14
 [53] Field of Search 195/61, 66, 103.5 R, 103.5 C, 435/186, 192, 1, 28

- [54] **METHOD OF STABILIZING α -GALACTOSIDASE**
 Inventors: Brooks M. Stein, Burlingame, James C. Linder, Loveland, both of Colo.
 Assignee: The Great Western Sugar Company, Denver, Colo.
 Filed: Feb. 23, 1979
- [57] **ABSTRACT**
 The activity of mycelial bound α -galactosidase is stabilized by treating α -galactosidase containing mycelia with about 5 to 25 percent by weight glutaraldehyde based upon the dry weight of the mycelia. The glutaraldehyde treated mycelia may be used in the hydrolysis of galactose containing substrates without incurring substantial α -galactosidase activity loss during hydrolysis.
- 5 Claims, No Drawings

References Cited

- 3,647,625 3/1972 Suzuki et al. 435/276

IMMOBILIZED ENZYMES

This profile includes immobilized or carrier-bound enzymes or microbial cells and processes for preparing them. Immobilization results when the enzyme or microbial cell is covalently or ionically bonded to a carrier or entrapped within a carrier. The carrier material physically confines the enzyme or microbial cell during a continuous process or enhances recoverability in a batch process. Examples of immobilized enzymes are enzymes chemically or physically bonded to a water-insoluble matrix, enzymes contained within a polymer or gel, and enzymes adsorbed on a resin.

INCLUDED IN THIS PROFILE ARE ALL OF THE PATENTS FROM:

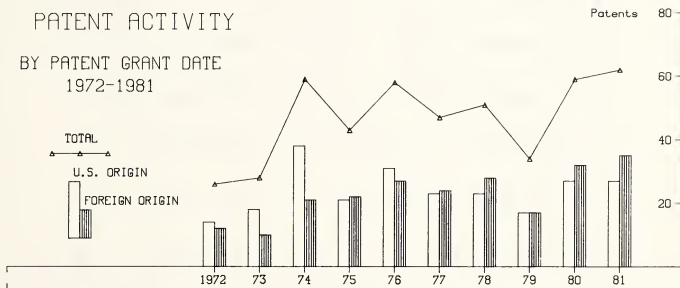
Class 435, Subclasses 174-182

ACTIVITY INDICES (1979-1981)

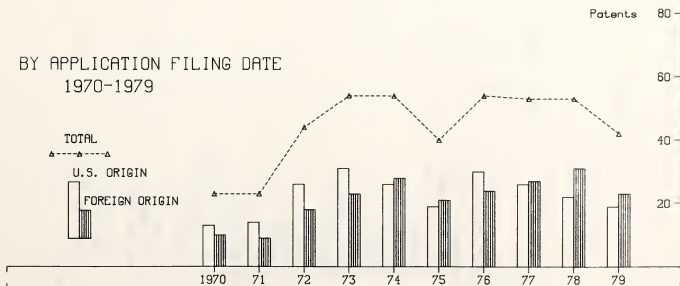
GROWTH	33.2%
FOREIGN SHARE	54.2%
CORPORATE OWNED	91.0%
GOVERNMENT OWNED	5.2%
U.S. OWNED OF FOREIGN	11.9%

PATENT ACTIVITY

BY PATENT GRANT DATE
1972-1981



BY APPLICATION FILING DATE
1970-1979



IMMOBILIZED ENZYMES - PART 2A

PATENT ACTIVITY (1/63-12/81) BY DATE OF PATENT GRANT

		NUMBER OF PATENTS														PAGE A	
		63-67	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	TOTAL
TOTAL		12	1	2	6	14	26	28	59	43	58	47	51	34	59	62	502
U.S. ORIGIN		6	1	2	6	9	14	18	38	21	31	23	23	17	27	27	263
FOREIGN ORIGIN		6				5	12	10	21	22	27	24	28	17	32	35	239
JAPAN		2					1	2	3	7	11	4	10	7	12	16	75
WEST GERMANY		1			1	3	4	3	3	2	4	3	5	2	8	1	40
UNITED KINGDOM					3			2	2	8	1	3	3	2	4	2	37
FRANCE							1	1	4	1	2	5	1	2	4	2	18
SWEDEN							1	1	4	1	2	5	1	4	1	16	13
SWITZERLAND							1				1	1	4	1			6
ISRAEL					1	3			1	1	1	1	1		4	1	11
DENMARK										1	1	1	1				4
NETHERLANDS										1	1	1	1				4
CZECHOSLOVAKIA		1				1	1	1	1	1	1	1	1	2	1	1	6
ITALY							1	1			1	1					3
AUSTRALIA											1						1
CANADA							1				1						2
BELGIUM														1		1	2
HUNGARY										1				1			2
AUSTRIA																	1
U.S. ORIGIN		6	1	2	6	9	14	18	38	21	31	23	23	17	27	27	263
U.S. CORP. OWNED		4	1	1	4	9	12	14	34	19	29	18	16	10	25	25	221
U.S. GOVT. OWNED							1	3	1	1	1	1	5	2	1	1	17
U.S. INDIV. OWNED		2			1	1	1	1	3	1	1	4	2	3	1	1	20
FOREIGN OWNED				1				1						2			5
FOREIGN ORIGIN		6			5	12	10	21	21	22	27	24	28	17	32	35	239
U.S. OWNED					1	4				1	2	2	2	1	5	4	20
FOREIGN OWNED		6			4	8	10	21	21	21	25	24	26	16	27	31	219
FOREIGN CORP. OWNED		3			4	8	8	20	19	19	19	22	24	16	25	28	196
FOREIGN GOVT. OWNED											2	1		2			3
FOREIGN INDIV. OWNED		3					2	1	2	4	2	1	1	2	2	1	16

IMMOBILIZED ENZYMES

PATENT ACTIVITY (PATENTS GRANTED 1/67-12/81) BY DATE OF PATENT APPLICATION

		NUMBER OF PATENTED APPLICATIONS																PAGE A	
		PRE 68	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	TOTAL		
TOTAL	U.S. ORIGIN	10	20	11	23	23	44	54	54	40	54	53	53	42	10		491		
	FOREIGN ORIGIN	9	13	5	13	14	26	31	26	19	30	26	22	19	4		257		
	FOREIGN ORIGIN	1	7	6	10	9	18	23	28	21	24	27	31	23	6		234		
U.S. ORIGIN	JAPAN	1		2	1	1	2	7	9	7	7	13	10	10	4		74		
	WEST GERMANY				2	2	3	6	1	3	2	6	9	4	1		39		
	UNITED KINGDOM		4	1	4	2	8	4	4	2	3	1	2	2			37		
	FRANCE						2	3	3	3	3	2	2	1			18		
	SWEDEN				1	2	1	3	4	3	4	3	2				16		
	SWITZERLAND						1	1	2	1	4	3	2				13		
	NETHERLANDS		3	1	1			1	9	1	1	1	1	2			9		
	DENMARK							1	1	1	1	1	1	2			6		
	CZECHOSLOVAKIA			1	1	1	1	1	1	1	1	1	1	1			6		
	ITALY							1	1	1	2						4		
	AUSTRALIA			1		1		1	1	1							4		
U.S. ORIGIN	CANADA																2		
	BELGIUM																2		
	HUNGARY																2		
	AUSTRIA						1					1	1	1			2		
	U.S. ORIGIN								1								1		
U.S. ORIGIN	U.S. ORIGIN	9	13	5	13	14	26	31	26	19	30	26	22	19	4		257		
	U.S. ORIGIN	6	12	5	10	12	23	29	23	14	23	19	19	18	4		217		
	U.S. ORIGIN				3					1	5	3	2				17		
	U.S. ORIGIN	1	1				2	2	2	4	2	2	1	1			18		
	U.S. ORIGIN	2				1						2					5		
U.S. ORIGIN	FOREIGN ORIGIN	1	7	6	10	9	18	23	28	21	24	27	31	23	6		234		
	U.S. ORIGIN		2	2	1			1	1	1	2	3	2	5			20		
	FOREIGN ORIGIN	1	5	4	9	9	18	22	27	20	22	24	29	18	6		214		
	FOREIGN ORIGIN	1	5	3	9	8	16	19	24	16	21	23	28	16	5		194		
	FOREIGN ORIGIN										1	1	1	2			7		
FOREIGN ORIGIN	FOREIGN ORIGIN		1	1	1	1	2	3	1	3							13		
	FOREIGN ORIGIN																		

IMMOBILIZED ENZYMES

Organizational Patenting: Ranked

NO. OF
PATENTS

ASSIGNEES WITH 4 OR MORE PATENTS (1969-1981)

35	CORNING GLASS WORKS
14	MONSANTO CO.
14	CPC INTERNATIONAL INC.
12	STANDARD BRANDS INC.
12	TANABE SEIYAKU CO. LTD.
11	UOP INC.
10	AMERICAN CYANAMID CO.
10	UNITED STATES OF AMERICA, AGRICULTURE
9	BOEHRINGER MANNHEIM GMBH
9	OWENS-ILLINOIS INC.
9	BAYER AKTIENGESellschaft
8	W.R. GRACE & CO.
8	MILES LABORATORIES INC.
7	BEECHAM GROUP LTD.
6	R.J. REYNOLDS TOBACCO CO.
5	RHONE-POULENC INDUSTRIES
5	JAPAN ATOMIC ENERGY RESEARCH INSTITUTE
5	KOCH-LIGHT LABORATORIES LTD.
5	NATIONAL RESEARCH DEVELOPMENT CORP.
5	RANKS HORSFORD MCDONOUGH LTD.
5	RESEARCH CORP.
5	DAI-ICHI KASEI KOGAKU KOGYOSHO LTD.
5	PFIZER INC.
5	PROCTER & GAMBLE CO.
5	SYVA CO.
5	NOVO INDUSTRI A/S
4	EXXON RESEARCH & ENGINEERING CO.
4	EXPLOATERINGS AKTIEBOLAGET T.B.F.
4	AGENCE NATIONALE DE VALORISATION DE LA RECHERCHE (ANVAR)
4	BAXTER TRAVENOL LABORATORIES INC.
4	TECHNICON INSTRUMENTS CORP.
4	YEDA RESEARCH AND DEVELOPMENT CO., LTD.
4	ČESKOSLOVENSKÁ AKADEMIE VED
4	PURDUE RESEARCH FOUNDATION
4	IMPERIAL CHEMICAL INDUSTRIES LTD.
4	GIST-BROCADES N.V.
4	PENICK & FORD LTD.
4	ROHM GMBH
4	SUMITOMO CHEMICAL CO., LTD.

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

ABBOTT LABORATORIES

4070246 - REACTIVE MATRICES

AB STADEX

3996107 - ENZYMATIC PRODUCTION OF A STARCH CONVERSION PRODUCT HAVING A HIGH MALTOSE CONTENT

A. E. STALEY MANUFACTURING COMPANY

3956066 - GLUCOSE ISOMERIZING ENZYME

AGENCE NATIONALE DE VALDRISATION DE LA RECHERCHE (ANVAR)

3753858 - METHOD OF CONVERTING GLUCOSE INTO FRUCTOSE

3933587 - METHOD FOR PRODUCTION OF IMMOBILIZED ENZYME

3950222 - METHOD OF IMMOBILIZING ENZYMES TO MICROBIAL CELLS

4004979 - PREPARATION OF ACTIVE PROTEINS CROSS-LINKED TO INACTIVE PROTEINS

AGENCY OF INDUSTRIAL SCIENCE & TECHNOLOGY

4160698 - ENZYME IMMOBILIZATION WITH AZIDO COMPOUNDS

4269941 - METHOD FOR ENZYME IMMOBILIZATION

AJINOMOTO COMPANY INCORPORATED

3985617 - IMMOBILIZATION OF BIOLOGICALLY ACTIVE PROTEINS WITH A POLYPEPTIDE AZIDE

4297173 - METHOD FOR DETERMINING AMMONIA AND SENSOR THEREFOR

4299669 - METHOD FOR DETERMINING THE CONCENTRATION OF AN L-AMINO ACID IN FERMENTATION

AKTIEBLAGET FERMENTA

4246346 - ANTIBIOTIC AND STEROID TRANSFORMATION PROCESS

AKZONA INCORPORATED

4292403 - DETECTION AND/OR DETERMINATION OF IGM, IGA, IGD AND IGE IMMUNOGLOBULINS

AMERACE CORPORATION

4160746 - IMMOBILIZED PROTEINS

4169014 - METHOD OF IMMOBILIZING PROTEINACEOUS SUBSTANCES

AMERICAN CYANAMID COMPANY

3730841 - ENCAPSULATED CARRIER BOUND ENZYMES

3753861 - BINDING ENZYMES TO CARBONYL POLYMERS

3766013 - PREPARATION OF WATER-INSOLUBLE CARRIER BOUND ENZYMES

3770588 - STORAGE STABILIZATION OF CARRIER BOUND ENZYMES

3770700 - NOVEL CARBONYL POLYMERS

3791927 - ENTRAPPED CARRIER BOUND ENZYMES

3809605 - FIBROUS MATS AND SHEETS CONTAINING IMMOBILIZED ENZYMES ENTRAPPED IN THEIR INTERSTICES

3809616 - DETECTING ANTI-CHOLINESTERASE MATERIALS

3847743 - ENZYMES BOUND TO CARBONYL POLYMERS

3867258 - LACTATE DEHYDROGENASE TEST MATERIAL

AMICON CORPORATION

3639306 - ENCAPSULATING PARTICLES AND PROCESS FOR MAKING SAME

ANHEUSER-BUSCH, INCORPORATED

3813320 - METHODS OF MAKING GLUCOSE ISOMERASE AND OF CONVERTING GLUCOSE TO FRUCTOSE

4208482 - IMMOBILIZATION OF GLUCOSE ISOMERASE

4242451 - METHOD OF TREATMENT OF FLOCCULATED HOMOGENATE OF MICROBIAL CELLS CONTAINING GLUCOSE ISOMERASE

ASAHI KASEI KOGYO KABUSHIKI KAISHA

3875008 - HOLLOW FILAMENT CONTAINING ENZYMES AND/OR MICROORGANISMS

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

(CONTINUED)

ASAH KASEI KOGYO KABUSHIKI KAISHA
4246351 - PROTEIN ADSORBENT

ASPRO-NICHOLAS LIMITED
3794563 - PREPARATION OF IMMOBILIZED ENZYMES

BASF AKTIENGESSELLSCHAFT

4235573 - MACROPOROUS POLYMERIC CARRIER FOR COVALENTLY BINDING PROTEINS, ITS PREPARATION AND ITS USE FOR FIXING ACTIVE PROTEINS
4266030 - MACROPOROUS POLYMERIC CARRIER FOR COVALENTLY BINDING PROTEINS, ITS PREPARATION AND ITS USE FOR FIXING ACTIVE PROTEINS

BATTELLE MEMORIAL INSTITUTE

4016044 - METHOD AND APPARATUS FOR GOVERNING THE REACTION RATE OF ENZYMIC REACTIONS
4066505 - PROCESS FOR EXTRACTING A POLYPEPTIDE FROM AN AQUEOUS SOLUTION
4088538 - REVERSIBLY PRECIPITABLE IMMOBILIZED ENZYME COMPLEX AND A METHOD FOR ITS USE

BAXTER TRAVENOL LABORATORIES, INC.

3639213 - STREPTOKINASE, CHEMICALLY BONDED TO A CARBOHYDRATE MATRIX
3708397 - SYRUP CONVERSION WITH IMMOBILIZED GLUCOSE ISOMERASE
3843442 - IMMOBILIZED GLUCOSE ISOMERASE
3876501 - BINDING ENZYMES TO ACTIVATED WATER-SOLUBLE CARBOHYDRATES

BAYER AKTIENGESSELLSCHAFT

3630841 - PURIFICATION OF ENZYME INHIBITORS
3834990 - ISOLATION OF ENZYMES AND ENZYME INHIBITORS
3871864 - WATER-INSOLUBLE PEPTIDE MATERIALS
3910825 - WATER-INSOLUBLE PEPTIDE MATERIALS
3910826 - WATER-INSOLUBLE PEPTIDE MATERIALS
4035234 - PROCESS FOR THE PREPARATION OF THE KALLIKREIN-TRYPSIN INHIBITOR
4167446 - WATER-SOLUBLE CARRIER-BOUND LIGANDS
4195128 - POLYMERIC CARRIER BOUND LIGANDS
4298395 - ACTIVATED POLYMERIC CARRIERS

BECKMAN INSTRUMENTS INC.

3574062 - METHOD OF IMMOBILIZING ENZYMES AND PRODUCT

BEECHAM GROUP LIMITED

3883394 - WATER-INSOLUBLE PENICILLIN ACYLASE
3910825 - WATER-INSOLUBLE PENICILLIN ACYLASE PREPARATION
4001264 - ENZYME COMPLEXES AND THEIR USE
4055635 - FIBRINOLYTIC COMPOSITIONS
4152210 - BIOLOGICALLY ACTIVE MATERIALS ATTACHED TO A FERROMAGNETIC SUPPORT
4230804 - WATER-INSOLUBLE PENICILLIN ACYLASE PREPARATION
4267273 - ENZYME PREPARATION HAVING AFFINITY FOR WATER-IMMISCIBLE LIQUIDS

BEHRINGWERKE AKTIENGESSELLSCHAFT

4066981 - PROCESS FOR PRODUCING A BOND BETWEEN POLYVINYLENE GLYCOL AND A SUBSTANCE CONTAINING PRIMARY AMINO GROUPS
4118349 - PROCESS FOR THE MANUFACTURE OF POLYSTYRENE LATEX COMPOUNDS

BIORESEARCH LIMITED

4028183 - PROCESS OF PREPARING DOUBLE SALTS OF S-ADENOSYL-L-METHIONINE

BOARD OF REGENTS OF THE UNIVERSITY OF NEBRASKA

4279998 - REGENERABLE INSOLUBLE SUPPORT FOR PROTEIN IMMOBILIZATION

BOEHRINGER INGELHEIM, GMBH

4182655 - ENZYME IMMOBILIZATION WITH A PROTEIN CARRIER

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

- BOEHRINGER MANNHEIM G.M.B.H.
 3711574 - COPOLYMERS OF ACRYLAMIDE
 3775253 - WATER-INSOLUBLE CARRIER-BOUND PROTEINS
 3806417 - CARRIER-BOUND ENZYME PREPARED BY REACTING AN ENZYME WITH A COMPOUND CONTAINING AN EPOXY GROUP AND AN UNSATURATED DOUBLE BOND AND THEN
 3935071 - PROCESS FOR THE CONVERSION OF GLUCOSE INTO GLUCONIC ACID
 3969287 - CARRIER-BOUND PROTEIN PREPARED BY REACTING THE PROTEIN WITH AN ACYLATING OR ALKYLATING COMPOUND HAVING A CARRIER-BONDING GROUP AND REACTING THE PRODUCT WITH A CARRIER
 4038140 - PROCESS FOR BINDING BIOLOGICALLY ACTIVE PROTEINS
 4081329 - PREPARATION OF CARRIER-BOUND MACROMOLECULAR COMPOUNDS
 4119589 - PROCESS FOR FIXING PROTEINS AND ENZYMES
 4182695 - POLYAMIDE-FIXED BIOLOGICALLY ACTIVE PROTEIN
 BYK MALLINCKRODT CHEMISCHE PRODUKTE GMBH
 4273865 - INSOLUBILIZED BIOCHEMICAL MATERIALS
- CCI LIFE SYSTEMS, INC., MESSE
 3989622 - UREASE IN INSOLUBLE FORM FOR CONVERTING UREA PRESENT IN A LIQUID
- ČESKOSLOVENSKÁ AKADEMIE VED
 3964973 - PREPARATION OF INSOLUBLE BIOLOGICALLY ACTIVE COMPOUNDS
 4085005 - METHOD OF PREPARING INSOLUBLE BIOLOGICALLY ACTIVE COMPOUNDS
 4087598 - METHOD OF PREPARING INSOLUBLE BIOLOGICALLY ACTIVE COMPOUNDS
 4245084 - ACTIVATED SOLID CARRIER AND A METHOD OF ITS PREPARATION
- CHILDREN'S HOSPITAL MEDICAL CENTER
 4040908 - POLAROGRAPHIC ANALYSIS OF CHOLESTEROL AND OTHER MACROMOLECULAR SUBSTANCES
- CHINNOI GYOGYSZER ES VEGYESZETI TERMEKEK GYARA RT.
 3875003 - PROCESS FOR THE PREPARATION OF PROSTAGLANDIN
- CHOAY S.A.
 4039382 - IMMOBILIZED RIBONUCLEASE AND ALKALINE PHOSPHATASE
- COMMUNITY BLOOD COUNCIL OF GREATER NEW YORK, INC.
 3994870 - PURIFICATION OF HEPATITIS B SURFACE ANTIGEN
- CORNING GLASS WORKS
 3519538 - CHEMICALLY COUPLED ENZYMES
 3556945 - ENZYME STABILIZATION
 3652761 - IMMUNOCHEMICAL COMPOSITES AND ANTIGEN OR ANTIBODY PURIFICATION THEREWITH
 3666627 - METHOD OF STABILIZING ENZYMES
 3716456 - ANION MONITORING SYSTEM
 3767535 - METHOD OF REACTING AN INSOLUBILIZED ENZYME IN A FLUID MEDIUM
 3783101 - ENZYMES BOUND TO CARRIERS HAVING A METAL OXIDE SURFACE LAYER
 3802997 - METHOD OF STABILIZING ENZYMES
 3808119 - METHOD OF STABILIZING ENZYMES
 3814174 - METHOD OF STABILIZING ENZYMES
 3841971 - ENERGETIC ENZYMES ADSORBED WITHIN POROUS INORGANIC CARRIERS
 3850751 - ENZYMES IMMOBILIZED ON POROUS INORGANIC SUPPORT MATERIALS
 3852496 - TREATMENT OF WHEY WITH IMMOBILIZED LACTASE AND GLUCOSE ISOMERASE
 3868304 - METHOD OF MAKING FRUCTOSE WITH IMMOBILIZED GLUCOSE ISOMERASE
 3886080 - CHELATING AGENTS COUPLED TO INORGANIC CARRIERS AND METHOD OF PREPARING
 3910823 - IMMOBILIZATION OF UREASE ON POROUS TITANIA
 3915804 - APPARATUS AND METHOD FOR MEASURING CONDUCTIVITY CHANGE IN A UREA-UREASE REACTION
 3930951 - BINDING ENZYMES TO POROUS INORGANIC CARRIERS

IMMOBILIZED ENZYMES

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

(CONTINUED)

CORNING GLASS WORKS

- 3939041 - METHOD OF MAKING FRUCTOSE
- 3965035 - ENZYME CARRIER REGENERATION
- 3982997 - IMMOBILIZED GLUCOSE ISOMERASE
- 3983000 - BONDING PROTEINS TO INORGANIC SUPPORTS
- 3992329 - SUPPORT OF ALUMINA-MAGNESIA FOR THE ADSORPTION OF GLUCOSE ISOMERASE ENZYMES
- 4002576 - ENZYME CARRIER REGENERATION
- 4011008 - IMMOBILIZATION OF PROTEINS ON INORGANIC SUPPORT MATERIALS
- 4072566 - IMMOBILIZATION OF BIOLOGICALLY ACTIVE PROTEINS
- 4087330 - IMMOBILIZATION OF ENZYMES USING RECYCLED SUPPORT MATERIALS
- 4149936 - HIGH SURFACE LOW VOLUME FUNGAL BIOMASS COMPOSITE
- 4149937 - HIGH SURFACE LOW VOLUME YEAST BIOMASS COMPOSITE
- 4153510 - HIGH SURFACE LOW VOLUME BIOMASS COMPOSITE
- 4246349 - STABILIZATION OF IMMOBILIZED BACTERIA
- 4246349 - DETECTING NEISSERIA VIA IMMOBILIZED ANTIBODY-ENZYME COMPLEX
- 4254218 - PREPARATION OF ENRICHED WHOLE VIRUS RADIOISOTOPES
- 4282315 - METHOD FOR CONTINUOUS CULTURING OF MICROBES
- 4286061 - METHOD FOR CONTINUOUS CULTURING OF MICROBES

CPC INTERNATIONAL INC.

- 3813318 - PRODUCTION OF XULOSE (DEXTRUSE) ISOMERASE ENZYME PREPARATIONS
- 3826714 - THERMOPHILIC GLUCOSE ISOMERASE ENZYME PREPARATION
- 3847740 - PROCESS FOR THE PRODUCTION OF LEVULOSE-BEARING SYRUPS
- 3847741 - TEMPERATURE-PROGRAMMED PROCESS FOR THE PRODUCTION OF LEVULOSE-BEARING SYRUPS
- 3935070 - PRODUCTION OF SWEET SYRUP FROM DEXTROSE MOTHER LIQUOR
- 3935070 - INERT, NON-POROUS GRANULES FOR FLOW CONTROL IN A PLUG FLOW REACTOR
- 3960663 - PROCESS FOR THE CONTINUOUS ISOMERIZATION OF DEXTROSE
- 4132595 - DEXTROSE PRODUCTION WITH IMMOBILIZED GLUCAMYLASE
- 4144127 - PROCESS FOR IMMOBILIZING GLUCOSE ISOMERASE
- 4226937 - GLUCOSE ISOMERIZATION ON POROUS DIOSILICA
- 4226937 - METHOD USING GLUCAMYLASE IMMOBILIZED ON POROUS ALUMINA
- 4252899 - PROCESS FOR IMMOBILIZING GLUCOSE ISOMERASE AND A METHOD OF CONTINUOUS ISOMERIZATION OF GLUCOSE
- 4259445 - IMMOBILIZED ENZYME CATALYST
- 4263400 - IMMOBILIZED ENZYMES

DAMON CORPORATION

- 4257884 - CHROMATOGRAPHY

DOS KROYER A/S

- 3910820 - METHOD OF MAKING STARCH HYDROLYSATES BY ENZYMATIC HYDROLYSIS

OENKI KAGAKU KOGYO KABUSHIKI KAISHA

- 3915797 - IMMOBILIZED ENZYMES
- 4205128 - PROCESS FOR PRODUCING IMMOBILIZED ENZYME COMPOSITIONS

DIAMOND SHAMROCK (POLYMERS) LIMITED

- 4217417 - RESIN CHELATES

DIRECTOR GENERAL OF AGENCY OF INDUSTRIAL SCIENCE AND TECHNOL

- 4307151 - ENZYME-ACTIVE FIBROUS MATERIALS AND METHOD FOR PREPARING SAME

DIRECTOR OF NATIONAL FOOD RESEARCH INSTITUTE

- 3962038 - PREPARATION OF WATER-INSOLUBLE ENZYMES
- 4001082 - METHOD OF ISOMERIZING GLUCOSE WITH ENZYME IMMOBILIZED WITHIN MICROBIAL CELL
- 4026391 - PREPARATION OF BEAD-SHAPED IMMOBILIZED ENZYME

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

DOW CHEMICAL COMPANY

- 4210723 - METHOD OF COUPLING A PROTEIN TO AN EPOXYLATED LATEX
- 4246390 - PROTEIN IMMOBILIZATION ON CHELATING RESINS

DR. EDUARD FRESCHEN-CHIMISCH-PHARMAZEUTISCHE INDUSTRIE KG.

- 4261828 - APPARATUS FOR THE DETOXIFICATION OF BLOOD

DYNAMIT NOBEL AKTIENGESellschaft

- 4188263 - CARRIER-BOUND ACYLASES
- 4271269 - REGENERATION OF AN ENZYME IMMOBILIZATE

E. I. DU PONT DE NEMOURS AND COMPANY

- 3788990 - ENZYME GEL AND USE THEREFOR

ENGELHARD MINERALS & CHEMICALS CORPORATION

- 3953292 - ENZYMES BOUND TO HEAT-ACTIVATED ATTAPULGITE CLAY

ENZYME TECHNOLOGY, INC.

- 4267270 - METHOD FOR THE DETERMINATION OF ANTIGENS AND ANTIBODIES USING SITE-DEACTIVATING MEDIA

ETABLISSEMENT DECLARE D'UTILITE PUBLIQUE OIT: INSTITUT PAS

- 4193982 - PROCESS FOR COUPLING BIOLOGICAL SUBSTANCES BY COVALENT BONDS
- 4241176 - MAGNETIC GEL SUITABLE TO IMMUNOENZYMATIC DETERMINATIONS

EXPLOATERINGS AKTIEBLAGET T.B.F.

- 3847745 - PREPARATION OF WATER-INSOLUBLE BIOLOGICALLY ACTIVE MATERIALS
- 3853708 - COUPLING BIOLOGICALLY ACTIVE SUBSTANCES TO DIXIRANE-CONTAINING POLYMERS
- 3959251 - STABILIZED AGAR PRODUCT AND METHOD FOR ITS STABILIZATION
- 4048416 - THIOPOLYMERS, THEIR DERIVATIVES AND METHODS FOR THEIR PREPARATION AND USE

EXYON RESEARCH + ENGINEERING CO.

- 3820669 - INSOLUBILIZED ENZYMES
- 3897308 - IMMOBILIZED ENZYMES AND METHOD FOR PREPARATION
- 3970521 - IMMOBILIZED GLYCENZYMES
- 4201691 - LIQUID MEMBRANE GENERATOR

FRANHOEFER-GESELLSCHAFT ZUR FORDERUNG DER ANGEWANDTEN FORSCH

- 4243692 - PROCESS FOR THE PRODUCTION OF SILICIC ACID HETEROPOLYCONDENSATES USEFUL AS COATING MATERIALS

FUJII PHOTO FILM CO., LTD

- 3748621 - PREPARATION OF ENZYME-CONTAINING MICROCAPSULE

GIST-BROCADES N.V.

- 3935607 - WATER-INSOLUBLE ENZYME COMPOSITION
- 4158021 - WATER-INSOLUBLE NITROGEN-CONTAINING BIOLOGICALLY ACTIVE ORGANIC SUBSTANCES
- 4158813 - FERMENTATION PROCESS
- 4242219 - NOVEL ENZYME PARTICLES AND THEIR PREPARATION

GIVAUDAN CORPORATION

- 4066504 - ALIPHATIC DIALDEHYDE-AROMATIC POLYAMINE CONDENSATION PRODUCTS BOUND TO PROTEINS AND ENZYMES
- 4184986 - NOVEL CONDENSATION PRODUCTS HAVING HIGH ACTIVITY TO INSOLUBILIZE PROTEINS AND PROTEIN-INSOLUBILIZED PRODUCTS
- 4186053 - INSOLUBILIZED ENZYME PRODUCT

GLAXO LABORATORIES LIMITED

- 3801458 - PROCESS FOR PREPARING CEPHALOSPORIN DERIVATIVES
- 3880713 - CEPHALOSPORIN COMPOUNDS

IMMOBILIZED ENZYMES

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

GREAT WESTERN SUGAR COMPANY

4241185 - METHOD OF STABILIZING +60 -GALACTOSIDASE

GROUPEMENT O INTERET ECONOMIQUE STX

4009286 - CONTINUOUS PRODUCTION OF FERMENTED LIQUIDS

GULF RESEARCH AND DEVELOPMENT COMPANY

3821084 - IMMOBILIZATION OF ENZYMES

3841970 - IMMOBILIZED ENZYMES

3844892 - METHOD OF IMMOBILIZING ENZYMES

HITACHI, LTD.

4307195 - IMMOBILIZED ENZYME MEMBRANE

HOFFMANN-LA ROCHE INC.

4181636 - PROCESS FOR PRODUCING IMMUNOLOGICAL DIAGNOSTIC REAGENTS

4226747 - IMMUNOLOGICAL DIAGNOSTIC REAGENTS COMPRISING THIO-AMINE TERMINATED LATEX PARTICLES

HONEYWELL INC.

3930957 - APPARATUS AND METHOD FOR BIOLOGICAL ANALYSIS

ILLINOIS WATER TREATMENT COMPANY

4289853 - HIGH LOADING OF IMMOBILIZED ENZYMES ON ACTIVATED CARBON SUPPORTS

ILLINOIS WATER TREATMENT COMPANY

4204041 - HIGH LOADING OF IMMOBILIZED ENZYMES ON ACTIVATED CARBON SUPPORTS

IMPERIAL CHEMICAL INDUSTRIES LIMITED

3700609 - GRAFT COPOLYMERS

4069104 - CONVERSION OF ALDOSE TO KETOSE IN THE PRESENCE OF OXYANIONS OR MIXED OXYANIONS OF TIN OR GERMANIUM

4151049 - COMPOSITIONS HAVING PROTEIN REACTIVE GROUPS, MEMBRANES, ELECTRODES COATED WITH SUCH COMPOSITIONS AND CHEMICAL ANALYSIS M

4177253 - MAGNETIC PARTICLES FOR IMMUNOASSAY

INSTITUT NATIONAL DE LA RECHERCHE AGRONOMIQUE

4203893 - COUPLING PRODUCTS OF CYTIOINE-OIPHOSPHOCHOLINE AND AMINO-COMPOUNDS FOR PHARMACEUTICAL USE

JAPAN ATOMIC ENERGY RESEARCH INSTITUTE

4177107 - PROCESS FOR PRODUCING COMPOSITION CONTAINING INSOLUBILIZED ENZYME AND/OR INSOLUBILIZED BACTERIAL CELLS

4193845 - IMMOBILIZATION OF ENZYMES OR BACTERIAL CELLS

4194066 - IMMOBILIZATION OF ENZYMES OR BACTERIA CELLS

4226938 - METHOD FOR IMMOBILIZING ENZYMES

4272617 - IMMOBILIZATION OF ENZYMES OR BACTERIA CELLS

KABUSHIKI KAISHA HAYASHIBARA SEIBUTSU KAGAKU KENKYUJO

4102743 - PROCESS FOR THE REMOVAL OF SUCROSE FROM A SUGAR MIXTURE

KALI-CHEMIE AKTIENGESellschaft

4230803 - PREPARATION OF WATER-INSOLUBLE ENZYME COMPOSITIONS

KANSAI PAINT CO., LTD.

4195129 - METHOD FOR IMMOBILIZING ENZYMES AND MICROBIAL CELLS

KEEVER COMPANY

3498882 - METHOD OF MAKING A ZINC LIPASE COMPLEX

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

- KOCH-LIGHT LABORATORIES LIMITED
 3668733 - WATER INSOLUBLE POLYMERS OF ACRYLAMIDE POLYMER
 3673065 - POLYMERS OF POLYMERIC MATERIALS
 3673066 - BONDING OF ENZYMES, ENZYME DERIVATIVES AND OTHER BIOLOGICALLY ACTIVE MOLECULES TO POLYMERIC MATERIALS
 3684761 - BONDING OF ENZYMES, ENZYME DERIVATIVES AND OTHER COMPOUNDS TO POLYMERIC MATERIALS
 4043869 - WATER INSOLUBLE BIOLOGICALLY ACTIVE MATERIAL
- KOMANOTBOLAGET KOKKUMS CHEMICAL AB + CO.
 4043871 - ENZYMIC SUBSTRATE COMPOSITION ADSORBED ON A CARRIER
- KONINKLIJKE NEDERLANDSCHE GISTEN-EN SPIRITUSFABRIEK N.V.
 3801463 - PREPARATION OF ENZYMES IN PARTICULATE FORM
- L AIR LIQUIDE, SOCIETE ANONYME POUR L'ETUDE ET L'EXPLOIT
 3959079 - INSOLUBILIZATION OF PROTEINS BY CHEMICAL ACTIVATION OF A POLYMERIZED SUPPORT AND CROSSLINKING OF THE PROTEIN TO THE SUPPORT
- LEUVEN RESEARCH + DEVELOPMENT VZW
 4180437 - PURIFICATION OF ANTISERUM FOR THROMBOSIS TEST
- LKB-PRODOKTER AB
 4021307 - METHOD AND APPARATUS FOR MEASURING TEMPERATURE CHANGES GENERATED BY ENZYME ACTIVITY
- MARINE COLLOIDS, INC.
 3966897 - MEDIUM FOR USE IN BIOASSAY AND METHOD OF USING SAME
- MASSACHUSETTS GENERAL HOSPITAL
 4261976 - METHOD AND GLYCOPROTEIN COMPOSITION FOR INHIBITION OF GROWTH OF TRANSFORMED CELLS AND TUMORS
- MASSACHUSETTS INSTITUTE OF TECHNOLOGY
 3878049 - BIOCHEMICAL TEMPERATURE-SENSITIVE PROBE AND METHOD FOR MEASURING REACTANT CONCENTRATIONS THEREOF
- MAX-PLANCK-GESELLSCHAFT ZUR FORDERUNG DER WISSENSCHAFTEN E.V.
 3791928 - PURIFICATION OF THYMIDINE KINASE
 4177038 - METHOD FOR THE PRODUCTION OF A VEHICLE SUBSTANCE WHICH IS CAPABLE OF COVALENT BONDING WITH BIOLOGICALLY ACTIVE MATTER
- MCDUGALL, RANKS HOVIS, LIMITED
 3702804 - HYDROLYTIC ENZYMES CHEMICALLY COUPLED TO CELLULOSE ETHERS
- MEDICAL COLLEGE OF WISCONSIN, INC.
 4239960 - COMPETITIVE ENZYME-LINKED IMMUNOASSAY
- MERCK PATENT GESELLSCHAFT MIT BESCHRANKTER HAFTUNG
 3959080 - CARRIER MATRIX FOR THE FIXATION OF BIOCHEMICALLY EFFECTIVE SUBSTANCES AND PROCESS FOR THE PREPARATION THEREOF
- MIDWEST RESEARCH INSTITUTE
 3959078 - ENZYME IMMOBILIZATION WITH A THERMOCHEMICAL-PHOTOCHEMICAL BIFUNCTIONAL AGENT
- MILES LABORATORIES INC.
 3959310 - IMMUNOLOGICALLY REACTIVE PARTICLES
 3684451 - METHOD FOR DETERMINATION OF COUPLING COMPOUNDS
 3779869 - ENZYME STABILIZATION
 3873426 - INSOLUBLE ENZYMES
 3974036 - PROCESS FOR CONDITIONING BACTERIAL CELLS CONTAINING GLUCOSE ISOMERASE ACTIVITY
 4212943 - PRODUCTION OF BACTERIAL CELL AGGREGATE
 4238565 - SPECIFIC BINDING ASSAY WITH A PROSTHETIC GROUP AS A LABEL COMPONENT

TMMDBT1 T7E0 FN7YMFS

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

(CONTINUED)

4251632 - PREPARATION OF A BACTERIAL CELL AGGREGATE

MILLIPORE CORPORATION
4066512 - BIOLOGICALLY ACTIVE MEMBRANE MATERIAL
4200690 - IMMUNOASSAY WITH MEMBRANE IMMORILIZED ANTIBODY

MINNESOTA	MINING AND MANUFACTURING COMPANY	FDAMS CONTAINING	IMMOBILIZED	ACTIVE ENZYMES
3905923	- POLY (UREA-URETHANE)			
4210722	- PROTEIN IMMOLIZER			

MITSUBISHI
CHEMICAL INDUSTRIES LTD.
- PROCESS FOR THE ISOMERIZATION OF GLUCOSE INTO FRUCTOSE
4008124
- INSOLUBILIZED GLUCOSE ISOMERASE
4078970
- PROCESS FOR THE RENEWAL OF AN INSOLUBILIZED GLUCOSE ISOMERASE
4113568
- PROCESS FOR THE RENEWAL OF AN INSOLUBILIZED GLUCOSE ISOMERASE
4205127
- METHOD AND APPARATUS FOR THE MEASUREMENT OF GLUCOSE CONTENT
4206080

MITSUBISHI GAS-CHEMICAL COMPANY, INC.
4092220 - PROCESS FOR MANUFACTURE OF L(+)-TARTARIC ACID OR SALTS THEREOF

MITSUBISHI RAYON CO., LTD.
4276381 - PREPARATION OF IMMobilIZED ENZYMES OF MICROORGANISMS

MITSUI SUGAR CO., LTD.
4191810 - PROCESS FOR THE PRODUCTION OF IMMIBILIZED GLUCOSE ISOMERASE

MITSUBI TOATSU CHEMICALS INC.
4202905 - LUMINOUS MATERIAL FOR USE IN FISHERY AND METHOD FOR THE PRODUCTION THEREOF

MONSANTO COMPANY	
3502545	- PROCESS FOR THE SEPARATION OF WATER-SOLUBLE POLYMERIC MATERIALS FROM UNBOUND PROTEIN OR PEPTIDE USING SEMIOPOROUS GEL
3597219	- CHILLPROOFING OF BEVERAGES USING INSOLUBLE POLYMER-ENZYME PRODUCT
3597220	- CHILLPROOFING OF BEVERAGES USING INSOLUBLE POLYMER-ENZYME PRODUCT
3616229	- POLYMER-ENZYME PRODUCTS COMPRISING PLURALITY OF ENZYMES COVALENTLY BOUND TO POLYMER
3625827	- WATER-SOLUBLE POLYMER-ENZYME PRODUCTS
3634288	- DETERGENT COMPOSITIONS CONTAINING SOLUBLE POLYMER-ENZYME PRODUCT
3649457	- ENZYMATIC PROCESSING WITH POLYMER-ENZYME PRODUCT
3668841	- ATTACHMENT OF ENZYMES TO SILICEOUS MATERIALS
3691016	- PROCESS FOR THE PREPARATION OF SILICEOUS MATERIALS
3691016	- POLYMER-ENZYME REACTOR
3708084	- POLYMER-ENZYME REACTOR
3715278	- ENZYME-POLYMER PRODUCT ATTACHED TO SURFACE OF SILICEOUS MATERIALS THEREOF
3741871	- PREPARATION OF IMMOBILIZED ENZYMES
3741871	- PREPARING A REACTOR CONTAINING ENZYMES ATTACHED TO DIALDEHYDE CELLULOSE

AMOUNT SINAI RESEARCH FOUNDATION, INC.
3741875 - PROCESS AND APPARATUS FOR OBTAINING A DIFFERENTIAL WHITE BLOOD CELL COUNT

NATIONAL PATENT DEVELOPMENT CORPORATION
3767790 - MICROORGANISMS
3860490 - PROCESS OF SUBJECTING A MICROORGANISM SUSCEPTIBLE MATERIAL TO A MICROORGANISM

NATIONAL RESEARCH DEVELOPMENT CORPORATION

3557073 - PRODUCTION OF A POLYMER HAVING DIHALO-S-TRIAZINYL GROUPS BOUND THEREO

3619374 - PRODUCTION OF A POLYMERIC MATRIX HAVING A RIDGELIALLY ACTIVE SUBSTANCE BOUND THEREO

IMMOBILIZED ENZYMES

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

NATIONAL RESEARCH DEVELOPMENT CORPORATION (CONTINUED)

- 3674767 - NOVEL POLYMERIC MATERIALS CONTAINING TRIAZINYL GROUPS
- 3824150 - ENZYME BOUND TO POLYMERIC SHEETS OF A TRIAZINE BRIDGING GROUP
- 4115305 - SUPPORT MATRIX FOR CARRYING BIOLOGICALLY ACTIVE MATERIALS AND PROCESS FOR THE PREPARATION THEREOF

NELSON RESEARCH + DEVELOPMENT COMPANY

- 4007089 - METHOD FOR BINDING BIOLOGICALLY ACTIVE COMPOUNDS

NEW YORK UNIVERSITY

- 4229537 - PREPARATION OF TRICHLORO-S-TRIAZINE ACTIVATED SUPPORTS FOR COUPLING LIGANDS

NOVO INDUSTRI A/S

- 3980521 - IMMOBILIZATION OF GLUCOSE ISOMERASE
- 4025389 - PROCESS AND ISOMERIZING GLUCOSE
- 4116771 - IMMOBILIZED SACCHARIFYING ENZYME PRODUCT AND PROCESS FOR PREPARATION THEREOF
- 4266029 - ENZYME IMMOBILIZATION
- 4288552 - IMMOBILIZED INTRACELLULAR ENZYMES

NOVO LABORATORIES, INCORPORATED

- 4138290 - GLUCOSE ISOMERIZATION UNDER EXPANDED BED CONDITIONS

OHIO STATE UNIVERSITY RESEARCH FOUNDATION

- 3930950 - METHOD OF IMMOBILIZING AN ENZYME

ORGANON INC.

- 3854083 - PREPARATION OF STABLE, WATER-SOLUBLE ENZYME CONJUGATES

ORTHO DIAGNOSTICS, INC.

- 4140662 - ATTACHMENT OF PROTEINS TO INERT PARTICLES

OWENS-ILLINOIS INC.

- 3839175 - POLYSACCHARIDE CYCLIC CARBAMATE CONTAINING COMPOUNDS
- 3839176 - ELECTRODEPOSITION OF ENZYMES
- 3839309 - POLYACRYLAMIDE DERIVATIVES AND METHOD OF INSOLUBILIZING ENZYMES THEREWITH
- 3860486 - INSOLUBILIZING ENZYMES WITH POLYSTYRENE DERIVATIVES
- 3996008 - ELECTROCHEMICAL POTENTIOMETRIC METHOD FOR SELECTIVELY DETERMINING ALKALINE PHOSPHATASE CONTENT IN AQUEOUS FLUIDS
- 3926734 - UREA ANALYSIS
- 3933589 - CHEMICAL IMMOBILIZATION OF ENZYMES
- 4001085 - IMMOBILIZATION OF ENZYMES ON AN INORGANIC MATRIX
- 4008126 - IMMOBILIZATION OF PROTEINS BY IN-SITU POLYMERIZATION

PALO ALTO MEDICAL RESEARCH FOUNDATION

- 4000098 - SEPARATION OF PROTEINS BY HYDROPHOBIC ADSORPTION

PENICK + FORO LIMITED

- 4029253 - PROCESS OF IMMOBILIZING ENZYMES
- 4029546 - COLUMN APPARATUS AND PROCESS FOR IMMOBILIZED ENZYME REACTIONS
- 4033820 - STARCH SPONGE COLUMN APPARATUS AND PROCESS FOR IMMOBILIZED ENZYME REACTIONS
- 4304857 - WHOLE CELL ENZYME COMPOSITION CONTAINING FUMED SILICA

PENTAPHARM A.G.

- 4137127 - PROCESS FOR THE PREPARATION OF THROMBIN-LIKE ENZYMES FROM SNAKE VENOMS

PFIZER INC.

- 3733205 - ENZYMATIC REMOVAL OF O-ACETYL FROM FERMENTED BEVERAGES
- 3905868 - ENZYMATIC DEACYLATION OF BENZYL- AND PHENOXYMETHYL-PENICILLIN TETRAZOLES

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

(CONTINUED)

- PFIZER INC.
 3521597 - IMMOBILIZED ENZYMES
 3521598 - IMMOBILIZED MICROBIAL CELLS
 4113586 - PROCESS FOR PREPARING 6-AMINOPENICILLANIC ACID
- PHARMACIA AKTIEBOLAG
 3645892 - METHOD OF BINDING WATER SOLUBLE PROTEINS AND WATER SOLUBLE PEPTIDES TO WATER-INSOLUBLE POLYMERS USING CYANOGEN HALIDE
 3788948 - METHOD OF BINDING, BY COVALENT BONDS, PROTEINS AND POLYPEPTIDES POLYMERS USING CYANATES
- PHARMACIA FINE CHEMICALS AB
 3914183 - PREPARATION IN BEAD FORM CONTAINING A WATER-INSOLUBLE POLYSACCHARIDE ACTIVATED BY CYANOGEN HALIDE, AND A PROCESS FOR THE PREPARATION OF SAME
 4175073 - REACTIVE DERIVATIVES OF HS-GROUP-CONTAINING POLYMERS
- PHOTO FILM CO., LTD.
 3691090 - ENCAPSULATION METHOD
- POLYMERIC ENZYMES, INC.
 3859169 - ENZYMES ENTRAPPED IN GELS
- PRESIDENT AND FELLOWS OF HARVARD COLLEGE
 4278761 - ENZYME ASSAY AND KIT THEREFOR
- PROCTER + GAMBLE COMPANY
 3519570 - ENZYME-CONTAINING DETERGENT COMPOSITIONS AND A PROCESS FOR CONGLUTINATION OF ENZYMES AND DETERGENT COMPOSITIONS
 3629123 - STABILIZED AMYLASE COMPOSITIONS
 3647630 - ENZYMICALLY ACTIVE COMPOSITION HAVING AN INSOLUBILIZED PROTEASE ENZYME COVALENTLY BONDED TO A WATER INSOLUBLE POLYANHYDROLYZABLE POLYMER
- 4115292 - ENZYME-CONTAINING DETERGENT ARTICLES
 4176079 - WATER-SOLUBLE ENZYME-CONTAINING ARTICLE
- PRODUITS CHIMIQUES UGINE KUHLMANN
 4209390 - PROCESS FOR BIOLOGICAL OENITRIFICATION OF EFFLUENTS
- PROJEKTIERUNG CHEMISCHE VERFAHRENSTECHNIK GMBH
 4200692 - PROCESS FOR THE PRODUCTION OF XULOSE BY ENZYMATIC HYDROLYSIS OF XYLAN
 4275159 - PROCESS FOR THE PRODUCTION OF XULOSE BY ENZYMATIC HYDROLYSIS OF XYLAN
- PROPORTIONAL ASSIGNMENTS
 3536587 - ENZYME RESIN AND A PROCESS FOR THE PREPARATION THEREOF
- PURDUE RESEARCH FOUNDATION
 4004980 - ENZYME ENTRAPMENT WITH CELLULOSE ACETATE FORMULATIONS
 4006059 - HYDROPHOBIC NONCOVALENT BINDING OF PROTEINS TO SUPPORT MATERIALS
 4063017 - POROUS CELLULOSE BEADS AND THE IMMOBILIZATION OF ENZYMES THEREWITH
 4090022 - POROUS CELLULOSE BEADS
- RANKS HORTS MCCOUGALL LIMITED
 3627638 - AMYLASE CHEMICALLY COUPLED TO CELLULOSE ETHERS
 3705890 - CELLULOSE CARBONATES AND METHOD FOR THEIR PREPARATION
 3713982 - ENZYME CHEMICALLY COUPLED TO CELLULOSE ETHER
 3810861 - ENZYMES ATTACHED TO CELLULOSE CARBONATE
 3841569 - PREPARATION OF IMMOBILIZED ENZYMES
- REDPATH SUGARS LIMITED
 4176006 - ENZYME IMMOBILIZATION WITH A DISULPHIDE BRIDGE

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

RESEARCH CORPORATION

- 3758396 - PREPARATION OF IMMOBILIZED ENZYME-MEMBRANE COMPLEXES BY ELECTRO-CODEPOSITION
- 3809613 - BIOCATALYTIC MODULE
- 3843446 - PREPARATION OF ENZYMATICALLY ACTIVE MEMBRANES
- 3972766 - PREPARATION OF ENZYME MEMBRANES CONTAINING MICROBIAL CELLS
- 3977941 - PROTEIN-ENZYME COMPLEX MEMBRANES

RESEARCH PRODUCTS REHOUT LTD.

- 4101380 - PROCESS FOR THE CROSS-LINKING OF PROTEINS
- 4251631 - CROSS-LINKED ENZYME MEMBRANE

RESEARCH TRIANGLE INSTITUTE

- 4053644 - PROCESS OF REMOVING THE COOKED FLAVOR FROM MILK
- 4087328 - PURIFICATION AND IMMOBILIZATION OF SULPHYRYL OXIDASE

RHONE-POULENC INDUSTRIES

- 4041190 - GRAFTED MINERAL CARRIERS FOR FIXING ENZYMES
- 4119494 - IMMOBILIZATION OF ENZYMES IN AN ANHYDROUS MEDIUM
- 4132596 - SUPPORT-AMINOACYLASE COMPLEXES
- 4258133 - ENZYME-SUPPORT COMPLEXES
- 4264732 - ENZYMAIC COMPOSITIONS FOR ISOMERIZING GLUCOSE INTO LEWULOSE

RHONE-PROGIL

- 3806412 - PROCESS OF ENZYMATICALLY DEPILETATING ANIMAL HIDES

R. J. REYNOLDS TOBACCO COMPANY

- 3930684 - CONTINUOUS ISOMERIZATION PROCESS UTILIZING IMMOBILIZED FLOCCULATE ENZYME
- 3980596 - AGGREGATE OF FLOCCULATED CELLS
- 3980596 - AGGREGATE OF FLOCCULATED CELLS
- 3980597 - AGGREGATE OF FLOCCULATED CELLS
- 4060456 - GLUCOSE ISOMERIZATION PROCESS
- 4061539 - PREPARATION AND USE OF GLUCOSE ISOMERASE

ROHM AND HAAS COMPANY

- 4266026 - CATALYTIC PROCESS UTILIZING HOLLOW FIBER MEMBRANES

ROHM G. M. B. H. CHEMISCHE FABRIK

- 4247643 - PREPARATION OF STABILIZED CARRIER-BOUND PROTEINS

ROHM GMBH

- 3764477 - PESIN-BOUND, PROTEIN-LIKE ACTIVE AGENTS PREPARED BY REACTING A PROTEIN WITH A WATER INSOLUBLE POLYMER OF ACRYLIC OR METH ACRYLIC ACID ANHYDRIDE
- 4039413 - METHOD OF BONDING A POLYPEPTIDE TO A MACROMOLECULAR POLYMERIC CARRIER BY IRRADIATION WITH LIGHT
- 4070348 - WATER-SWELLABLE, BEAD COPOLYMER
- 4190713 - PEARL POLYMER CONTAINING HOLLOW PEARLS

ROQUETTE FRERES

- 4163691 - INSOLUBLE ENZYMATICALLY ACTIVE PARTICLES

SAGAMI CHEMICAL RESEARCH CENTER

- 4284721 - METHOD FOR MANUFACTURING OIPEPTIDES

SANRAKU-OCEAN CO., LTD.

- 4148689 - IMMOBILIZATION OF MICROORGANISMS IN A HYDROPHILIC COMPLEX GEL

IMMOBILIZED ENZYMES

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

SCHERING AKTIENGESELLSCHAFT

3987159 - STABLE SENSITIZED ERYTHROCYTES AND PREPARATION MEANS

SHOWA SANGYO KABUSHIKI KAISHA

4106987 - METHOD OF ISOMERIZING GLUCOSE TO FRUCTOSE

SNAM PROGETTI S.P.A.

3947325 - PREPARATION OF HIGH PERMEABILITY CELLULOSE FIBERS CONTAINING ENZYMES

4100029 - METHOD FOR IMPROVING THE ACTIVITY OF OXIDOREDUCTASE ENZYMES EMBEDDED IN FILAMENTARY STRUCTURES

SNOW BRAND MILK PRODUCTS, CO., LTD.

4184919 - METHOD OF GELLING MICROBIAL MYCELIA

SOCIETE D ASSISTANCE TECHNIQUE POUR PRODUITS NESTLE S.A.

3821083 - PREPARATION OF IMMOBILIZED ENZYMES

4017364 - PROCESS FOR PRODUCING AN ENZYME PRODUCT HAVING VARIABLE SOLUBILITY

4094743 - ENZYMES IMMOBILIZED ON CHITOSAN

SOCIETE GENERALE DE RECHERCHES ET D APPLICATIONS SCIENTIFI

3836433 - FIXATION OF NITROGENOUS MATERIALS

SOCIETE NATIONALE DES PETROLES O AQUITAINE

3950666 - PREPARATION OF AN ENZYME-CELLULOSE COMPLEX

STAMICARBON B.V.

3919048 - INSOLUBLE CARRIER-BOUND ENZYMES

STAMICARBON N.V.

3775378 - CHEMICAL BINDING OF AN AMINO ACID TO A CHLORSULFONATED POLYMER CARRIER

STANDARD BRANDS, INCORPORATED

3623953 - METHOD FOR ISOMERIZING GLUCOSE SYRUPS

3654080 - PROCESS FOR ISOMERIZING GLUCOSE TO FRUCTOSE

3694314 - PROCESS FOR ISOMERIZING GLUCOSE TO FRUCTOSE

3788945 - PROCESS FOR ISOMERIZING GLUCOSE TO FRUCTOSE

3817832 - PROCESS FOR ISOMERIZING GLUCOSE TO FRUCTOSE

3821082 - TREATING CELLS OF MICROORGANISMS CONTAINING INTRACELLULAR GLUCOSE ISOMERASE

3909354 - PROCESS FOR ISOMERIZING GLUCOSE TO FRUCTOSE

3933588 - ENZYME TREATMENT

4011137 - PROCESS FOR PRODUCING DEXTROSE USING MIXED IMMOBILIZED ENZYMES

4102745 - PROCESS FOR PRODUCING DEXTROSE USING MIXED IMMOBILIZED ENZYMES

4110164 - AGGLOMERATED FIBROUS CELLULOSE

4111750 - SYSTEMS FOR CONVERTING LIQUEFIED STARCH TO A MIXTURE OF GLUCOSE AND FRUCTOSE UTILIZING A MULTI-COMPONENT IMMOBILIZED ENZ

YNE SYSTEM

STANDARD OIL COMPANY

3819610 - PROCESS FOR PREPARING POLYCELLULAR PORTEIN PRODUCTS

SUMITOMO CHEMICAL COMPANY, LIMITED

4146432 - IMMOBILIZED PROTEASES

4170596 - ENZYME-IMMOBILIZATION CARRIER AND PREPARATION THEREOF

4239854 - ENZYME-IMMOBILIZATION CARRIERS AND PREPARATION THEREOF

4247642 - ENZYME IMMOBILIZATION WITH PULLULAN GEL

SUMMA CORPORATION

4059685 - IMMOBILIZED IMMUNOABSORBENT

IMMOBILIZED ENZYMES

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

SYNBAR ASSOCIATES, MESNE
3481952 - N-(1-OXIDE-2,2,5,5, TETRA LOWER ALKYL PYRROLCOINYL-3, -MALEIMIDES

SYVA COMPANY

3453288 - ELECTRON SPIN RESONANCE LABELS FOR BIOMOLECULES
3453289 - PHOTOCHEMICALLY ACTIVATED COUPLING TO POLYPEPTIDES
3520772 - METHOD FOR CONJUGATING TO POLYAMINE COMPOUNDS EMPLOYING HALOACYL GROUPS AND COMPOSITIONS PREPARED THEREBY
4275149 - MACROMOLECULAR ENVIRONMENT CONTROL IN SPECIFIC RECEPTOR ASSAYS
4281065 - PHENCYCLOINE CONJUGATES TO ANTIGENIC PROTEINS AND ENZYMES

TAKEDA CHEMICAL INDUSTRIES LTD.

3945888 - METHOD FOR THE PRODUCTION OF CEPHALOSPORINS
4011135 - PRODUCTION OF L(+)-TARTARIC ACID
4075405 - BETA-1,3-GLUCAN DERIVATIVES

TANABE SEIYAKU CO. LTD.

3791926 - PROCESS FOR THE PRODUCTION OF L-ASPARTIC ACID
3806040 - OPTICAL RESOLUTION OF RACEMIC AMINO ACIDS
3886040 - NOVEL PROCESS FOR PREPARING L-CITRULLINE
3898127 - PROCESS FOR PREPARING UROCANIC ACID
3898128 - PROCESS FOR PREPARING L-ALANINE
3922195 - PROCESS FOR PREPARING L-MALIC ACID
3935072 - PURIFICATION OF COENZYME A
3953291 - PROCESS FOR PREPARING 6-AMINOPENICILLANIC ACID
4081327 - PREPARATION OF D-FRUCTOSE
4090919 - WATER-INSOLUBLE TANNIN PREPARATION FOR IMMOBILIZATION OF PROTEINS
4138292 - IMMOBILIZED CATALYTICALLY ACTIVE SUBSTANCE AND METHOD OF PREPARING THE SAME
4224411 - IMMOBILIZED AMINOACYLASE

TECHNICON INSTRUMENTS CORPORATION

4204040 - COPOLYMERIZATION OF PROTEINS ON AN INORGANIC SUPPORT
4206286 - IMMOBILIZATION OF PROTEINS ON INORGANIC SUPPORTS
4217415 - IMMOBILIZATION OF AN ENZYME SUBSTRATE
4263844 - INSOLUBILIZED PROTEINS AND IMMUNOASSAYS UTILIZING THEM

TEMPLE UNIVERSITY

4078971 - BOUND, ACTIVE CELLULAR ORGANELLES AND METHOD OF PRODUCING SAME

TLC CORPORATION

3814584 - ANALYTICAL METHOD EMPLOYING ACTIVE MATERIAL CONTAINED

TORAY INDUSTRIES INC.

4275156 - GLUCOSE ISOMERASE IMMOBILIZED PRODUCT AND PROCESS FOR PREPARING SAME

TOYO BOSEKI KABUSHIKI KAISHA

4240889 - ENZYME ELECTRODE PROVIDED WITH IMMOBILIZED ENZYME MEMBRANE

TOYO JOZO COMPANY, LTD.

3909360 - PROCESS FOR PRODUCING INSOLUBILIZED ENZYME
3960662 - PROCESS FOR THE PRODUCTION OF 7-AMINO-CEPHEM COMPOUNDS
4287345 - POLYFUNCTIONAL DISULFIDE COMPOUNDS HAVING S+13 S EXCHANGE REACTIVITY

TOYO SODA MANUFACTURING CO., LTD.

4066827 - PROCESS FOR PRODUCING A POLYION COMPLEX HAVING A NUCLEIC ACID BASE

IMMOBILIZED ENZYMES

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ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

UNITED KINGDOM ATOMIC ENERGY AUTHORITY
3943072 - SEPARATION OF MOLECULES

UNITED STATES OF AMERICA, AGRICULTURE
3672955 - PREPARATION OF AN INSOLUBLE ACTIVE ENZYME
3736231 - PREPARATION OF INSOLUBILIZED ENZYMES
3745088 - ACTIVE WATER-INSOLUBLE ENZYMERS
3767531 - PREPARATION OF INSOLUBILIZED ENZYMES
3909358 - INSOLUBILIZED ENZYMES
3985616 - IMMOBILIZATION OF ENZYMES WITH A STARCH-GRAFT COPOLYMER
4121974 - PREPARATION OF RETROGRADATION-RESISTANT STARCHES WITH IMMOBILIZED AMYLASES
4121974 - PREPARATION OF RETROGRADATION-RESISTANT STARCHES WITH IMMOBILIZED AMYLASES
4187177 - METHOD FOR INSOLUBILIZING ENZYMES ON CHITOSAN
4184998 - HIGHLY ABSORBENT POLYHYDROXY POLYMER GRAFT COPOLYMERS WITHOUT SAPONIFICATION

UNITED STATES OF AMERICA, DEPARTMENT OF ENERGY

4032407 - TAPERED BED BIOREACTOR
4127447 - BIOMASS GROWTH RESTRICTION IN A PACKED BED REACTOR
4287305 - MICROORGANISM IMMOBILIZATION

UNITED STATES OF AMERICA HEALTH EDUCATION AND WELFARE, MESNE
3796634 - INSOLUBILIZED BIOLOGICALLY ACTIVE ENZYMES

UNITED STATES OF AMERICA, INTERIOR

4113587 - INSOLUBILIZATION OF ENZYMES ON MODIFIED PHENOLIC POLYMERS

UNITED STATES OF AMERICA, NAVY

4069106 - IMMOBILIZATION OF ENZYMES ON KERATIN
4089746 - METHOD FOR INSOLUBILIZING ENZYMES ON CHITOSAN

UNITIKA LTD.

4273873 - PREPARATION OF ANTITHROMBOGENIC POLYMERIC MATERIALS

UNIVERSAL RESEARCH AND DEVELOPMENT CORP.

4252901 - SYSTEM AND PROCESS FOR ANAEROBIC DIGESTION

UNIVERSITY OF UTAH

3966580 - NOVEL PROTEIN-IMMOBILIZING HYDROPHOBIC POLYMERIC MEMBRANE, PROCESS FOR PRODUCING SAME AND APPARATUS EMPLOYING SAME
4046633 - DIRECT RENIN ASSAY SYSTEM AND METHOD

UNIVERSITY OF VIRGINIA

3849254 - PROCESS FOR EFFECTING ENZYMIC REACTIONS IN AEROSOLS

UOP INC.

4141857 - SUPPORT MATRICES FOR IMMOBILIZED ENZYMES
4183910 - PREPARATION OF SUPPORT MATRICES FOR IMMOBILIZED ENZYMES
4206259 - SUPPORT MATRICES FOR IMMOBILIZED ENZYMES
4218932 - PREPARATION OF SUPPORT MATRICES FOR IMMOBILIZED ENZYMES
4248989 - REGENERATION OF AN IMMOBILIZED ENZYME SYSTEM
4250260 - REGENERATION OF AN IMMOBILIZED ENZYME SYSTEM
4250263 - METHOD OF PURIFICATION OF THERMALLY STABLE ENZYMES
4268419 - SUPPORT MATRICES FOR IMMOBILIZED ENZYMES
4268423 - SUPPORT MATRICES FOR IMMOBILIZED ENZYMES
4292199 - METHOD OF PREPARING A SUPPORT MATRIX

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

VADETEC S.A.

4234681 - IMMOBILIZED LIGHT EMITTING SYSTEMS

VISCOSSE DEVELOPMENT COMPANY LIMITED

3905954 - ACTIVATED CELLULOSE

WISCONSIN ALUMNI RESEARCH FOUNDATION

4144131 - IMMOBILIZATION OF ENZYMES ON HUMAN TISSUE OR ERYTHROCYTES

W. B. GRACE & CO.

3936135 - PREPARATION AND USE OF ENZYMES BOUND TO POLYURETHANE

3929874 - USE OF ENZYMES BOUND TO POLYURETHANE

4084744 - WATER-DISPERSIBLE PROTEIN/POLYURETHANE REACTION PRODUCT

4098645 - IMMOBILIZATION OF PROTEINS WITH POLYURETHANE POLYMERS

4195127 - PROCESS FOR IMMOBILIZING PROTEINS

4226935 - ENZYMIC DIAGNOSTIC COMPOSITION

4237229 - IMMOBILIZATION OF BIOLOGICAL MATERIAL WITH POLYURETHANE POLYMERS

4250267 - IMMOBILIZED BIOLOGICAL MATERIAL

YEDA RESEARCH AND DEVELOPMENT CO., LTD.

3627640 - ENZYME PURIFICATION AND DECOLORIZATION

3650000 - ENZYME-BINDING MEMBRANE ENZYME PRODUCTS

3650900 - POLYMERIC ENZYME PRODUCTS

4013511 - IMMOBILIZED ENZYMES

YELLOW SPRINGS INSTRUMENT COMPANY, INC.

3979274 - MEMBRANE FOR ENZYME ELECTRODES

4073713 - MEMBRANE FOR ENZYME ELECTRODES

IMMOBILIZED ENZYMES - PART 2D

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INVENTOR NAME		INVENTORS OF INDIVIDUALLY OWNED PATENTS (1/75-12/81)		(ALPHA LISTING)		ST	ZIP/CNTRY
		CITY					
ALI	MAJIO	19 EDELMONT PL.	TEANECK			NJ	07666
4256833	- ENZYME IMMUNOASSAY FOR ALLERGIC DISORDERS						
ALLEN	BILLY R.	2034 DUBLIN-GRANVILLE RD.	COLUMBUS			OH	43229
4115198	- METHOD OF IMMOBILIZATION OF BIOLOGICALLY ACTIVE ORGANIC SUBSTANCES INCLUDING ENZYMES					PA	19101
BARRETT	M. JAMES	1500 SPRING GARDEN ST.	PHILADELPHIA				
4001583	- COVALENTLY BOUND BIOLOGICAL SUBSTANCES TO PLASTIC MATERIALS AND USE IN RADIOASSAY					CH	
BRENNER	MAX	SPIEGELBERGSTRASSE 33	CH-4059 BASEL				
3956113	- PROCESS FOR THE MANUFACTURE OF AMINO COMPOUNDS FIXED TO CARRIERS						
CHARLES	MARVIN	622 N. 29 ST.	ALLENTOWN			PA	18104
4048018	- METHOD OF CARRYING OUT ENZYME CATALYZED REACTIONS						
4115198	- METHOD OF IMMOBILIZATION OF BIOLOGICALLY ACTIVE ORGANIC SUBSTANCES INCLUDING ENZYMES					CT	06268
COUGHLIN	ROBERT W.	49 STORRS	HEIGHTS RD.			PA	18018
4115198	- METHOD OF IMMOBILIZATION OF BIOLOGICALLY ACTIVE ORGANIC SUBSTANCES INCLUDING ENZYMES						
COUGHLIN	ROBERT W.	902 SEVENTH AVE.	BETHLEHEM				
3928143	- METHOD OF CARRYING OUT ENZYME-CATALYZED REACTIONS					EN	
4048018	- METHOD OF CARRYING OUT ENZYME CATALYZED REACTIONS						
CRAVEN	DAVID BARRY	18 EVERSLEY PARK, STORETON RD.	OXTON, BIRKENHEAD, C				
3904478	- IMMOBILIZED CO-ENZYMES					MO	21210
CUATRECASAS	PEORO	10 HILLSIDE ROAD	BALTIMORE				
3947352	- POLYSACCHARIDE MATRICES FOR USE AS ADSORBENTS IN AFFINITY CHROMATOGRAPHY TECHNIQUES					NJ	08816
DAVIS	FRANK F.	19 FARMINGDALE RD.	EAST BRUNSWICK				
4179337	- NON-IMMUNOGENIC POLYPEPTIDES					EN	
DEAN	PETER OUNCAN	43 REDGATE	FORMBY, LANCASHIRE				
3904478	- IMMOBILIZED CO-ENZYMES					SW	
EKMAN	BO MAGNUS	GRANTVAGEN 6 B	S-752 43 UPPSALA			EN	
4081466	- BIOLOGICALLY ACTIVE COMPOSITION AND THE USE THEREOF						
EPTON	ROGER	22 WINCHESTER RISE	ODDLEY, WORCESTERSHI			NY	10607
3896092	- MATERIAL FOR GEL PERMEATION CHROMATOGRAPHY						
FAYEWI	ALFRED	15 FRANCINE CT.	WHITE PLAINS			MA	02146
4256833	- ENZYME IMMUNOASSAY FOR ALLERGIC DISORDERS						
FOLKMAN	MOSES J.	18 CHATHAM CIR.	BROOKLINE			IL	
4164560	- SYSTEMS FOR THE CONTROLLED RELEASE OF MACROMOLECULES						
FREEMAN	AMIHAY	21 KIRIATH SEFER ST.	RISHON LEZION			IL	
3970597	- NOVEL SUBSTITUTED POLYAMIDES AND PROCESS FOR PRODUCING THEM					AU	
GARNETT	JOHN LYNOON	29 ARABELLA ST.	LONGUEVILLE, NEW SOU				
3981775	- ENZYME INSOLUBILIZATION						

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GIACIN 409219 -	JACK R. PREPARATION OF ENZYME-MEMBRANE COMPLEXES	ALLENTOWN	NJ	08501	
GILBERT 4092219 -	SEYMOUR G. PREPARATION OF ENZYME-MEMBRANE COMPLEXES	PISCATAWAY	NJ	08854	
GOLDSTEIN 3970597 -	LEON NOVEL SUBSTITUTED POLYAMIDES AND PROCESS FOR PRODUCING THEM	REHVDOTH		IL	
GREGOR 4033817 -	HARRY P. PRESSURE-DRIVEN ENZYME-COUPLED MEMBRANES	LEONIA	NJ	07605	
4033822 -	ENZYME-COUPLED ULTRAFILTRATION MEMBRANES				
4163714 -	SEPARATING SUBSTANCES WITH PRESSURE-DRIVEN SORPTION MEMBRANES				
HASSELBLAD 4061141 -	FRITZ VICTOR APPARATUS AND METHOD FOR SELECTIVELY SEPARATING AMINO ACIDS AND DEFINED PROTEINS IN BLOOD	GOTEBORG		SW	
HOLLWAY 3896092 -	CHRISTOPHER MATERIAL FOR GEL PERMEATION CHROMATOGRAPHY	SMETHWICK, WDRLEY, W		EN	
HYDEN 4061141 -	VIKTOR HOLGER APPARATUS AND METHOD FOR SELECTIVELY SEPARATING AMINO ACIDS AND DEFINED PROTEINS IN BLOOD	GOTEBORG		SW	
ISE 3983097 -	NORID METHOD OF PRODUCING HIGH MOLECULAR DERIVATIVES	NAKANOSAKA, KITA, KY		JA	
KENYON 3981775 -	ROBERT SYDNEY ENZYME INSOLUBILIZATION	EASTWOOD, NEW SOUTH		AU	
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LIDDY 3981775 -	MICHAEL JAMES ENZYME INSOLUBILIZATION	CASTLE HILL, NEW SOUTH		AU	
LIN 4092219 -	PD-MIN PREPARATION OF ENZYME-MEMBRANE COMPLEXES	PISCATAWAY	NJ	08854	
LINDMARK 4061466 -	NILS ROGER BIOLOGICALLY ACTIVE COMPOSITION AND THE USE THEREOF	S-752 41 UPPSALA		SW	
MCLAREN 3896092 -	JOHN VINCENT MATERIAL FOR GEL PERMEATION CHROMATOGRAPHY	FINCHFIELD, WOLVERHA		EN	
MESA-TEJADA 4256833 -	RICARDO ENZYME IMMUNOASSAY FOR ALLERGIC DISORDERS	BRIARCLIFF MANDR	NY	10510	
NALEBUFT 4256833 -	DONALD ENZYME IMMUNOASSAY FOR ALLERGIC DISORDERS	OAKLAND	NJ	07436	
DKUBO 3983097 -	TUNED METHOD OF PRODUCING HIGH MOLECULAR DERIVATIVES	NISHIDE, FUSHIMI, KY		JA	

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INVENTORS OF INDIVIDUALLY OWNED PATENTS (1/75-12/81)		(ALPHA LISTING)		PAGE 0	
INVENTOR NAME	STREET	CITY	ST	ZIP/CNTRY	
PARIKH	INDU				
3947352	- POLYSACCHARIDE MATRICES FOR USE AS ADSORBENTS IN AFFINITY CHROMATOGRAPHY TECHNIQUES	BALTIMORE	MO	21210	
RAMANARAYAN	P. MADHAVA				
4256833	- ENZYME IMMUNOASSAY FOR ALLERGIC DISORDERS	NEW YORK	NY	10032	
SAWYER	PHILIP N.				
4238480	- METHOD FOR PREPARING AN IMPROVED HEMOSTATIC AGENT AND METHOD OF EMPLOYING THE SAME	BROOKLYN	NY	11209	
SENJU	RYOICHI	HIGASHIWAKAHISA, MIN		JA	
SJODHOLM	INGVAR GOSTA				
4061466	- BIOLOGICALLY ACTIVE COMPOSITION AND THE USE THEREOF	S-752 45, UPPSALA		SW	
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4073689	- METHOD FOR IMMOBILIZING ENZYME	FUKUOKA		JA	
TURCOTTE	HECTOR				
4288540	- REAGENT FOR THE EARLY DETECTION OF CANCER	SILLERY, QUEBEC		CA	

PATENTS (1/63-12/81) WITH NEITHER ASSIGNMENT NOR INVENTOR INFORMATION IN THE DATA BASE

3539455	- MEMBRANE POLAROGRAPHIC ELECTRODE SYSTEM AND METHOD WITH ELECTROCHEMICAL COMPENSATION				
3639558	- IMMUNOLOGICAL REAGENT PARTICLES HAVING PROTEINOUS MATERIALS COVALENTLY BONDED THERETO				
3715277	- PREPARATION OF FIBERS CONTAINING FIBERS				
3736230	- PROCESS FOR PRODUCING 6-AMINOPENCILLANIC ACID				
3809615	- METHOD AND MEANS FOR NATURAL GAS DETECTION				
3827565	- METHOD AND MEANS FOR DETECTING PANCREAS				
3827565	- METHOD AND MEANS FOR DETECTING PANCREAS				
3850798	- METHOD FOR SEPARATING A POLYPEPTIDE FROM MICROORGANISMS				
3410754	3413198 3414479 3415804 3416997 3418211 3419471 3419472 3095307 3126324 3139390 3167485				

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4,323,650	4,269,941	4,254,218
4,326,031	4,218,363	4,182,655
4,324,858	4,263,400	4,247,643
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4,320,194	4,210,723	4,208,482
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4,321,327	4,229,536	4,177,038
4,318,988	4,210,722	4,224,411
4,318,990	4,121,974	4,090,919
4,321,141	4,251,632	4,245,064
4,310,554	4,179,337	4,246,349
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4,312,946	4,264,732	4,206,286
	4,193,845	4,217,415
	4,276,381	4,176,006
	4,188,263	4,209,390
	4,252,899	4,138,290
	4,138,292	4,167,446
	4,258,133	4,281,065
	4,250,260	4,152,210
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	4,259,445	4,253,844
	4,110,164	
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		4,191,810
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		4,102,745
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		4,248,969

PATENTS ARE LISTED IN ORDER OF APPEARANCE

[54] PROCESS FOR THE PRODUCTION OF CARRIER PARTICLES FROM YEAST CELLS BY USING A GROWING MEDIUM CONTAINING AGENTHEROPHILIC AND HYDROPHILIC AGENTS CONTAINING SUCH AGENTS

[75] Inventor: Frederick G. Bull, West Wellow, England

[73] Assignee: Gist-Broeders N.V., Delft, Netherlands

[21] Appl. No.: 172,992

[22] Filed: Jul. 28, 1980

[30] Foreign Application Priority Data

Jul. 30, 1979 [GB] United Kingdom 26580/79

[51] Int. Cl. G01N 33/54

[52] U.S. Cl. 435/175, 435/255, 435/810, 424/12, 232/230 B

[58] Field of Search 435/7, 810, 175, 255, 435/260, 174, 424/8, 12, 232/230 B

18 Claims, No Drawings

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4,072,817 8/1978 Morton et al. 435/7

Primary Examiner—Benoit Castel
Attorney, Agent, or Firm—Hammond & Littell, Washenberger and Muehrstein

ABSTRACT

Yeast cells are converted into carrier particles useful as carriers for the adsorption of antigens and for immunization tests by cross-linking the proteins of the cell cytoplasm followed by stabilization of the carbohydrates of the cell wall by reaction with an epoxide. The epoxide is then reacted with a hydroxy compound which is either linked to the hydroxyl groups in the cell surface. They may be coupled to the protein or other material by activation, e.g. with cyanuric chloride, followed by reaction with the hydroxy compound. The material to be adsorbed is then adsorbed onto the carrier to produce diagnostic agents useful in test kits.

[54] CARBOHYDRATE PROCESS

[75] Inventors: John A. Maselli, Willson; Robert O. Horwath, Westport, both of Conn.

[73] Assignee: Standard Brands Incorporated, New York, N.Y.

[21] Appl. No.: 160,758

[22] Filed: Jan. 18, 1980

[51] Int. Cl. C12P 7/06; C12P 19/02

[52] U.S. Cl. 435/182, 435/190, 435/813, 435/819

[58] Field of Search 435/147, 813, 819, 182

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4,346,347 1/1981 Nedelman et al. 435/105

4,347,041 1/1981 Nedelman et al. 435/157

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4,347,041 1/1981 Nedelman et al. 435/157

[54] CARBOHYDRATE PROCESS

[75] Inventors: John A. Maselli, Willson; Robert O. Horwath, Westport, both of Conn.

[73] Assignee: Standard Brands Incorporated, New York, N.Y.

[21] Appl. No.: 160,758

[22] Filed: Jan. 18, 1980

[51] Int. Cl. C12P 7/06; C12P 19/02

[52] U.S. Cl. 435/182, 435/190, 435/813, 435/819

[58] Field of Search 435/147, 813, 819, 182

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4,102,142 7/1978 Klose et al. 435/813 X

4,346,347 1/1981 Nedelman et al. 435/105

4,347,041 1/1981 Nedelman et al. 435/157

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[52] U.S. Cl. 435/182, 435/190, 435/813, 435/819

[58] Field of Search 435/147, 813, 819, 182

References Cited

U.S. PATENT DOCUMENTS
3,911,149 10/1975 Oshiro et al. 435/813 X

4,102,142 7/1978 Klose et al. 435/813 X

4,346,347 1/1981 Nedelman et al. 435/105

4,347,041 1/1981 Nedelman et al. 435/157

[54] CARBOHYDRATE PROCESS

[75] Inventors: John A. Maselli, Willson; Robert O. Horwath, Westport, both of Conn.

[73] Assignee: Standard Brands Incorporated, New York,

United States Patent [19]

Messing

- | | |
|---------------------------------|---------------------------|
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| 612655 | 8/1979 Switzerland 210/16 |

Microbiology: Reid McGraw, Hill New York 1972

- Primary Examiner—Ernest G. Therkorn
Attorney, Agent, or Firm—Pennie & Edmonds

g/l of nitric nitrogen, which comprises using an active

- 1 Claim. No Drawings**

(11) 4,318,990

- | | | | |
|-----------|----------|----------------|-----------|
| 1,293,143 | 12/19/94 | Henicke | 435/176 |
| 1,293,251 | 11/19/94 | Messing | 435/176 |
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|--------|--------|----------|---------|
| 551339 | 3/1977 | U.S.S.R. | 435/815 |
|--------|--------|----------|---------|
- Primary Examiner—David M. Naff*
Attorney, Agent, or Firm—Larson and Taylor
- ABSTRACT**
- [37]
- Proteases are separated from fluids by contacting a fluid

particles to sorb the proteases and then eluting the prote-

- proteases from the inorganic material. Proteases which may be separated are the supharyl proteases including chymotrypsin, trypsin, and elastase, and the serine proteases, stem bromelain, fruit bromelain, ficin, calopapain, stem bromelain. Elution of the protease may be carried out with plant juice from which protease has previously been removed. The porous inorganic material is preferably that prepared by mixing a finely divided sorptive inorganic material with a solid fugitive adsorbent and a solvent to dissolve the fugitive, forming discrete particles from the resultant mixture and heating the particles to remove the solvent and fugitive to produce discrete particles of the inorganic material for contacting with the fluid.

United States Patent [19]

[57]

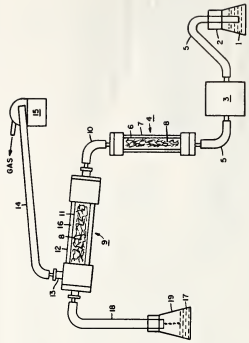
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| 4,221,625 | 9/1980 | Lehman | 210/616 |

Primary Examiner—Thomas G. Wyse

- ABSTRACT**
- A method for processing biodegradable organic waste in an aqueous medium, which method comprises serially passing an organic waste-containing aqueous medium through a first, hydrolytic redox bioreactor and a second anaerobic bioreactor with each bioreactor con-

taining immobilized microbes. The disclosure also pro-

- provides an apparatus and process for determining the biochemical oxygen demand of an organic waste in an aqueous medium.



39 Claims, 2 Drawing Figures

United States Patent

[11] 4,269,941

[45] May 26, 1981

Ichimura

METHOD FOR ENZYME

- [54] **IMMOBILIZATION**
 [75] Inventor: Kunihiko Ichimura, Yokohama, Japan
 [73] Assignee: Agency of Industrial Science and Technology, Ministry of International Trade & Industry, both of Tokyo, Japan

[21] Appl. No.: 62,486
 [22] Filed: Jul. 31, 1979
 [30] Foreign Application Priority Data
 Aug. 9, 1978 (JP) Japan 53/9804
 [51] Int. Cl.: C12N 11/00
 [52] U.S. Cl.: 435/182, 435/180
 [58] Field of Search: 435/174, 171, 180, 181, 435/182

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[56] **U.S. PATENT DOCUMENTS**
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 Samokhin et al., Photochemical Immobilization of Enzymes, *Chem. Abstr.*, vol. 90, 2435C, 1/1979 (p. 245).
Primary Examiner—David M. Naff
Attorney—John O'Brien, Fisher, Spivak, McClelland & Maier

ABSTRACT

Enzymes are immobilized by dissolving in water a photo-crosslinking resin containing aluminum groups, vinyl alcohol units and vinyl acetate units, adding an enzyme to the resultant aqueous solution and exposing the solution to ultraviolet light to crosslink the resin and produce a polymer containing the enzyme entrapped therein.

8 Claims, No Drawings

United States Patent

[19] 4,263,400

Ushiro

IMMOBILIZED ENZYMES

- [75] Inventor: Sokchiro Ushiro, Kobunang, Japan
 [73] Assignee: CPC International Inc., Englewood Cliffs, N.J.

[21] Appl. No.: 2,839

[22] Filed: Jan. 11, 1979
 [30] Foreign Application Priority Data
 May 12, 1978 (JP) Japan 53-56961
 [51] Int. Cl.: C12N 11/00; C12P 19/24
 [52] U.S. Cl.: 435/177; 435/94
 [58] Field of Search: 435/179, 180, 92, 234, 426/814, 815

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 1371469 10/1974 United Kingdom 435/94
Primary Examiner—David M. Naff

ABSTRACT

When immobilizing enzymes such as glucose isomerase on a carrier, the enzyme is first dissolved in water, the enzyme prior to adsorption on the carrier is separated from a high molecular weight, non-dialyzable polysaccharide which inhibits adsorption of the enzyme to the carrier.

10 Claims, 1 Drawing Figure

United States Patent

[11] 4,218,363

[45] Aug. 19, 1980

Rohrbach et al.

PREPARATION OF SUPPORT MATRICES

- [75] Inventor: Ronald W. Rohrbach, Essex Lake, Ontario, Canada; W. Robert Hoffman, Estates, both of Ill.
 [73] Assignee: UOP Inc., Des Plaines, Ill.

[21] Appl. No.: 891,947
 [22] Filed: Oct. 16, 1979
 [51] Int. Cl.: C08K 9/00
 [52] U.S. Cl.: 260/42.4; 260/42.54; 252/344; 525/714;
 [58] Field of Search: 525/314, 525/316, 525/318, 525/319, 525/320, 525/321, 525/322, 525/323, 525/324, 525/325, 525/326, 525/327, 525/328, 525/329, 525/330, 525/331, 525/332, 525/333, 525/334, 525/335, 525/336, 525/337, 525/338, 525/339, 525/340, 525/341, 525/342, 525/343, 525/344, 525/345, 525/346, 525/347, 525/348, 525/349, 525/350, 525/351, 525/352, 525/353, 525/354, 525/355, 525/356, 525/357, 525/358, 525/359, 525/360, 525/361, 525/362, 525/363, 525/364, 525/365, 525/366, 525/367, 525/368, 525/369, 525/370, 525/371, 525/372, 525/373, 525/374, 525/375, 525/376, 525/377, 525/378, 525/379, 525/380, 525/381, 525/382, 525/383, 525/384, 525/385, 525/386, 525/387, 525/388, 525/389, 525/390, 525/391, 525/392, 525/393, 525/394, 525/395, 525/396, 525/397, 525/398, 525/399, 525/400, 525/401, 525/402, 525/403, 525/404, 525/405, 525/406, 525/407, 525/408, 525/409, 525/410, 525/411, 525/412, 525/413, 525/414, 525/415, 525/416, 525/417, 525/418, 525/419, 525/420, 525/421, 525/422, 525/423, 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United States Patent

[11] 4,210,722
[45] Jul. 1, 1980

Silver

[54] PROTEIN IMMOBILIZER
[75] Inventor: Spencer F. Silver, White Bear Lake, Minn.
[73] Assignee: Minnesota Mining and Manufacturing Company, St. Paul, Minn.

[21] Appl. No.: 851,492
[22] Filed: Nov. 14, 1977
[51] Int. Cl.: C07C 7/00; C07G 7/00
[52] U.S. Cl.: 435/176; 232/330 B; 252/428; 260/112 R; 310/311; 424/12; 435/185
[58] Field of Search: 195/63; 68; DIG. 11; 260/112 R; 32.6 A; 352/433; 435/176, 177, 180; 7; 232/330 B; 424/12; 310/311

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4,071,469 1/1978 Meising et al. 195/63 X
4,072,526 2/1978 Meising et al. 195/63
Primary Examiner—David M. Naff
Attorney, Agent, or Firm—Louis E. Davidson
M. Sell; Carolyn A. Bates

ABSTRACT

Biologically active proteins are immobilized on porous supports by first applying to the support a monolayer of a water-soluble polymer containing a β -hydroxyalkylamine moiety wherein the equivalent weight of the polymer based on the β -hydroxyalkylamine is 100% and then reacting the support with the protein to form a covalent bond between the protein and the polymer-treated support and remain substantially all of its biological activity.

30 Claims, No Drawings

United States Patent

[11] 4,251,632
[45] Feb. 17, 1981

Chen et al.

[54] PREPARATION OF A BACTERIAL CELL AGGREGATE
[75] Inventors: Anthony H. Chen; Yee-Chi Jao, both of Elkhart, Ind.
[73] Assignee: Miles Laboratories, Inc., Elkhart, Ind.
[21] Appl. No.: 941,183
[22] Filed: Sep. 11, 1978
[51] Int. Cl.: C12N 1/00; C12P 19/24
[52] U.S. Cl.: 435/233; 435/902
[58] Field of Search: 435/94, 174, 180, 182, 435/233, 902

ABSTRACT

A shaped bacterial cell aggregate having increased hardness is produced by adding previously-produced dried finely-divided bacterial cell aggregate to neutralized bacterial cell aggregate subsequent to its formation but prior to its shaping.

6 Claims, No Drawings

United States Patent

[11] 4,121,974
[45] Oct. 24, 1978

Hofreiter et al.

[54] PREPARATION OF RETROGRADATION-RESISTANT STARCHES WITH IMMOBILIZED AMYLASES
[75] Inventors: Bernard T. Hofreiter, Fortia, Karl L. Bailey, Morton, John A. Bonaldi, Robert L. Dill, all of St. Louis, Mo.
[73] Assignee: The United States of America as represented by the Secretary of Agriculture, Washington, D.C.
[21] Appl. No.: 811,298
[22] Filed: Jan. 29, 1977
[51] Int. Cl.: C12D 13/02
[52] U.S. Cl.: 189/7; 195/11 R; 195/115
[58] Field of Search: 195/47; 31 R; 43; 64; 195/115; 195/DIG. 11; 113

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Coughlin et al., "Lactate and other Enzymes bound to a Phenol-Formaldehyde Resin with Glutaraldehyde", *J. Food Chem.*, vol. 21, No. 3, (1973), pp. 440-445.
Berker et al., "Enzyme Reactions for Radiary", *Process Biochemistry*, vol. 6, No. 10 (1971), pp. 11-12.
Primary Examiner—Thomas G. Wiseman
Attorney, Agent, or Firm—McBoward Silverstein; David G. McConnell; Curtis P. Blomstedt

ABSTRACT

Retrogradation-resistant starches of reduced molecular weight are prepared by immobilizing amylase on the amylose component of ordinary starches with amylose immobilized on porous carriers which are preferentially sorptive to amylose over amylopectin.

11 Claims, No Drawings

United States Patent

[11] 4,179,337
[45] Dec. 18, 1979

Davis et al.

[54] NON-IMMUNOGENIC POLYPEPTIDES
[75] Inventors: Frank E. Davis, 19 Farnside Rd., East Brunswick, N.J. 08816
Theodore Van Ra, 313 Overbrook Rd., Piscataway, N.J. 08854;
Richard C. Feltz, 1000 S. Broad Street, N.J. 08805
[21] Appl. No.: 919,811
[22] Filed: Jul. 28, 1977

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3,607,635 9/1971 Ziffer et al. 195/63
3,618,371 11/1971 Crook et al. 195/63
3,657,131 1/1973 Ogier et al. 195/63
3,644,833 2/1972 Kaplan et al. 195/64
3,781,948 5/1974 Ogier et al. 195/64
3,959,060 5/1976 Ogier et al. 195/DIG. 11
4,053,635 10/1977 Green et al. 195/DIG. 11
Primary Examiner—David M. Naff
Attorney, Agent, or Firm—Oswi M. Beir

ABSTRACT

Polypeptides such as enzymes and insulin are coupled to polyethylene glycol or polypropylene glycol having a molecular weight of 500 to 20,000 daltons to provide a non-immunogenic polypeptide composition. The polyethylene glycol or polypropylene glycol protect the polypeptide from heat of activity and the composition can be injected into a host animal without the need for an auxiliary system with substantially no immunogenic response.

27 Claims, No Drawings

Ishimatsu et al.

[11] May 27, 1980

Larrigan et al.

[11] Apr. 28, 1981

[54] PROCESS FOR PRODUCING IMMOBILIZED ENZYME COMPOSITIONS

[75] Inventors: Yoshiaki Ishimatsu, Machida, Shigeki Shigeta, Sagami, Hirokazu Shigematsu, Tokyo, Hiroshi Kato, Sagami, Tokyo, Yoshiaki Machida, all of Japan

[73] Assignee: Densetsu Kagaku Kogyo Kaseihachi, Kasei, Tokyo, Japan

[21] Appl. No.: 934,773

[22] Filed: Aug. 25, 1978

[23] Related U.S. Application Data

[24] Continuation of Ser. No. 781,921, Mar. 28, 1977, abandoned.

[25] Foreign Application Priority Data

[26] Mar. 31, 1976 [JP] Japan 51/28471

[27] Int. Cl. C12 43/12, 43/14

[28] U.S. Cl. 435/99, 435/205, 435/204

[29] Field of Search 195/63, 68, DIG. 11

[30] References Cited

[31] 195/63, 68, DIG. 11

[32] 195/63, 68, DIG. 11

[33] 195/63, 68, DIG. 11

[34] 195/63, 68, DIG. 11

[35] 195/63, 68, DIG. 11

[36] 195/63, 68, DIG. 11

[37] 195/63, 68, DIG. 11

[38] 195/63, 68, DIG. 11

[39] 195/63, 68, DIG. 11

[40] 195/63, 68, DIG. 11

[41] 195/63, 68, DIG. 11

[42] 195/63, 68, DIG. 11

[43] 195/63, 68, DIG. 11

[44] 195/63, 68, DIG. 11

[45] 195/63, 68, DIG. 11

[46] 195/63, 68, DIG. 11

[47] 195/63, 68, DIG. 11

[48] 195/63, 68, DIG. 11

[49] 195/63, 68, DIG. 11

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[54] 195/63, 68, DIG. 11

[55] 195/63, 68, DIG. 11

[56] 195/63, 68, DIG. 11

[57] 195/63, 68, DIG. 11

[58] 195/63, 68, DIG. 11

[59] 195/63, 68, DIG. 11

[60] 195/63, 68, DIG. 11

[61] 195/63, 68, DIG. 11

[62] 195/63, 68, DIG. 11

[63] 195/63, 68, DIG. 11

[64] 195/63, 68, DIG. 11

[65] 195/63, 68, DIG. 11

[66] 195/63, 68, DIG. 11

[67] 195/63, 68, DIG. 11

[68] 195/63, 68, DIG. 11

[69] 195/63, 68, DIG. 11

[70] 195/63, 68, DIG. 11

References Cited

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3,355,084 12/1972 Reynolds

3,355,087 8/1974 Van Vleet

3,355,091 9/1974 Amos et al.

4,001,284 1/1977 Gaudet et al.

Primary Examiner—David M. Naff

Attorney, Agent, or Firm—O'Brien, Fisher, Spink, McClelland & Miller

ABSTRACT

Immobilized enzyme compositions for industrial use are produced by reacting an enzyme with a support containing microorganism cells with an anion-exchange high molecular substance having a quaternary pyridine ring in its molecule, then subjecting the reaction product to ion exchange and to ion exchange.

A polyfunctional crosslinking agent may be added at any stage of the process. The immobilized enzyme composition thus prepared can be packed in a reactor of an industrial plant for continuous enzyme reaction.

13 Claims, No Drawings

13 Claims, No Drawings

13 Claims, No Drawings

13 Claims, No Drawings

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13 Claims, No Drawings

13 Claims, No Drawings

13 Claims, No Drawings

13 Claims, No Drawings

13 Claims, No Drawings

[54] ENZYMATIC COMPOSITIONS FOR ISOMERIZING GLUCOSE INTO LEULOSE

[75] Inventors: Guy Larrigan, Albert Bouaile, Michel Guerin, all of Melles, France

[73] Assignee: Rhone-Poulenc Industries, Paris, France

[21] Appl. No.: 926,821

[22] Filed: Jul. 31, 1978

[23] Foreign Application Priority Data

[24] Jul. 31, 1978 France 77,23846

[25] Int. Cl. C12 19/24, C12N 1/12, C12N 1/10

[26] U.S. Cl. 435/94, 435/179, 435/132, 435/813

[27] Field of Search 195/DIG. 11, 45, 59, 435/94, 179, 132, 813

[28] References Cited

[29] 3,731,205 5/1973 Yoshino et al.

[30] 3,731,206 4/1973 Yoshino et al.

[31] 3,941,655 3/1976 Hsiao et al.

[32] 4,004,860 1/1977 Emery et al.

[33] 4,004,860 1/1977 Emery et al.

[34] 4,004,860 1/1977 Emery et al.

[35] 4,004,860 1/1977 Emery et al.

[36] 4,004,860 1/1977 Emery et al.

[37] 4,004,860 1/1977 Emery et al.

[38] 4,004,860 1/1977 Emery et al.

[39] 4,004,860 1/1977 Emery et al.

[40] 4,004,860 1/1977 Emery et al.

[41] 4,004,860 1/1977 Emery et al.

[42] 4,004,860 1/1977 Emery et al.

[43] 4,004,860 1/1977 Emery et al.

[44] 4,004,860 1/1977 Emery et al.

[45] 4,004,860 1/1977 Emery et al.

[46] 4,004,860 1/1977 Emery et al.

[47] 4,004,860 1/1977 Emery et al.

[48] 4,004,860 1/1977 Emery et al.

[49] 4,004,860 1/1977 Emery et al.

[50] 4,004,860 1/1977 Emery et al.

[51] 4,004,860 1/1977 Emery et al.

[52] 4,004,860 1/1977 Emery et al.

[53] 4,004,860 1/1977 Emery et al.

[54] 4,004,860 1/1977 Emery et al.

[55] 4,004,860 1/1977 Emery et al.

[56] 4,004,860 1/1977 Emery et al.

[57] 4,004,860 1/1977 Emery et al.

[58] 4,004,860 1/1977 Emery et al.

[59] 4,004,860 1/1977 Emery et al.

[60] 4,004,860 1/1977 Emery et al.

[61] 4,004,860 1/1977 Emery et al.

[62] 4,004,860 1/1977 Emery et al.

[63] 4,004,860 1/1977 Emery et al.

[64] 4,004,860 1/1977 Emery et al.

[65] 4,004,860 1/1977 Emery et al.

[66] 4,004,860 1/1977 Emery et al.

[67] 4,004,860 1/1977 Emery et al.

[68] 4,004,860 1/1977 Emery et al.

[69] 4,004,860 1/1977 Emery et al.

[70] 4,004,860 1/1977 Emery et al.

[71] 4,004,860 1/1977 Emery et al.

[72] 4,004,860 1/1977 Emery et al.

[73] 4,004,860 1/1977 Emery et al.

[74] 4,004,860 1/1977 Emery et al.

United States Patent

Sakimae et al.

[11] 4,276,381
[45] Jun. 30, 1981

- [54] PREPARATION OF IMMOBILIZED ENZYMES OF MICROORGANISMS
- [75] Inventors: Makino Sakimae, Osaka; Hideo Otsuki, Hiroshima, both of Japan
- [73] Assignee: Mitsubishi Rayon Company, Ltd., Tokyo, Japan
- [21] Appl. No.: 60,907
- [22] Filed: Jul. 26, 1979
- [30] Foreign Application Priority Data
- Apr. 9, 1979 [JP] Japan 54-42725
- [51] Int. Cl.³ C12N 1/22; C12N 1/04
- [52] U.S. Cl. 435/176; 435/182
- [58] Field of Search 435/174, 177, 180, 179, 435/182
- [56] References Cited
- 1,860,490 1/1975 Gung 435/182
- 8 Claims, No Drawings

ABSTRACT

Immobilized enzymes or microorganisms are prepared by dispersing lumps of ice containing an enzyme or microorganism in a water-insoluble high-molecular weight substance dissolved therein, and then removing the organic solvent to entrap the ice lumps in the water-insoluble high-molecular weight substance. Deactivation of the enzyme or microorganism by organic solvent is prevented, and the enzyme or microorganism being entrapped in the lumps of ice.

United States Patent

Enokizono et al.

[11] 4,252,899
[45] Feb. 24, 1981

- [54] PROCESS FOR IMMOBILIZING GLUCOSE ISOMERASE AND A METHOD OF CONTINUOUS ISOMERIZATION OF GLUCOSE
- [75] Inventors: Shigehiko Enokizono, Ageo; Satoshi Ito, Tokyo; Kazuhiko Ito, Tokyo, both of Japan
- [73] Assignee: CGC International Inc., Englewood Cliffs, N.J.
- [*] Notice: The portion of the term of this patent subsequent to Mar. 13, 1986, has been disclaimed.
- [21] Appl. No.: 3,182
- [22] Filed: Jan. 15, 1979
- Related U.S. Application Data
- Continuation of Ser. No. 780,734, Mar. 21, 1977, Pat. No. 4,138,292
- [58] Foreign Application Priority Data
- Apr. 2, 1976 [JP] Japan 51-36179
- [51] Int. Cl.³ C12P 8/24
- 3 Claims, No Drawings

Primary Examiner—Thomas G. Wieman

ABSTRACT

Glucose isomerase is immobilized in an active form by adsorbing the glucose isomerase onto a colloidal silica. The enzyme is contacted with the colloidal silica and the resulting composite solidified by treating. Optimum conditions for the immobilization of the glucose isomerase are then used for the isomerization of glucose to fructose.

- [32] U.S. Cl. 435/94, 435/176; 435/182
- [38] Field of Search 435/94, 176, 182
- [56] References Cited
- 3,669,441 6/1972 Miller 435/176
- 3,700,000 1/1973 Miller 435/176
- 3,930,951 1/1976 Meising 435/176
- 3,933,587 1/1976 Meising 435/176
- 3,933,588 1/1976 Meising 435/176
- 3,964,065 5/1976 Itozaki et al. 435/94

United States Patent

Hulmann et al.

[11] 4,188,263
[45] Feb. 12, 1980

- [54] CARRIER-BOUND ACYLASES
- [75] Inventors: Hans-Lee Hulmann, Witten; Fed. Rep. of Germany; Guster Renckhoff, Witten; Fed. Rep. of Germany; Guster Renckhoff, Witten; Fed. Rep. of Germany; by Brunhilde Renckhoff, Witten; Fed. Rep. of Germany; representative
- [73] Assignee: Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany
- [21] Appl. No.: 87,277
- [22] Filed: Jan. 28, 1978
- [30] Foreign Application Priority Data
- Jan. 29, 1977 [DE] Fed. Rep. of Germany 2703703
- [51] Int. Cl.³ C07G 7/02; C12D 13/06
- [52] U.S. Cl. 435/182; 435/183; 435/184; 159/26 P; 28; 356/32
- [58] Field of Search 435/182, 183, 184, 159/26 P, 28, 356/32
- 2 Claims, No Drawings

ABSTRACT

Immobilizations of acylases (N-acyl-L-amino acid amidohydrolases) are prepared by binding the acylase to a carrier by reacting the acylase with a chemically bound reactive group of a cellulose derivative. The cellulose derivative is in the form of a hydroxyethyl cellulose derivative group of cellulose containing at least two reactive functional groups to provide the reactive group. The reaction of a hydroxyl group of the cellulose derivative with a reactive group of the reagent with cellulose dissolved in dimethylsulfoxide containing polyhydroxyethylene for reaction of the cellulose and reagent to form acid derivative.

United States Patent

Chibata et al.

[11] 4,138,292
[45] Feb. 6, 1979

- [54] IMMOBILIZED CATALYTICALLY ACTIVE SUBSTANCE AND METHOD OF PREPARING THE SAME
- [75] Inventors: Ichiro Chibata, Saito; Tetsuya Tsue, Kyoto; Iao Taita, Takasaki, all of Japan
- [73] Assignee: Topy Sanyo Co., Ltd., Osaka, Japan
- [21] Appl. No.: 807,239
- [22] Filed: Jan. 16, 1977
- [30] Foreign Application Priority Data
- Jul. 2, 1976 [JP] Japan 51-7046
- [51] Int. Cl.³ C07G 7/02; C12B 1/00
- [52] U.S. Cl. 435/182; 435/183; 435/184; 159/63
- [58] Field of Search 435/182, 183, 184, 159/63
- [56] References Cited
- 3,223,931 12/1965 Alrich et al. 159/63
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Enzymes, 3rd ed., vol. 3, pp. 12-14 (1970).

Applied Microbiology, May 1974, pp. 874-885, vol. 27, No. 5.

Primary Examiner—Lionel M. Shapiro
Attorney, Agent, or Firm—Bernman & Bernman

ABSTRACT

An enzyme or microorganism is entrapped within the gel matrix of a sulfated agarose. The gel matrix of a sulfated agarose is a water-soluble polymer of a sulfated moiety in its molecule in the presence of ammonium ion, a metal ion, a water-soluble amine or a water-insoluble organic solvent. This shows a high level of catalytic activity for a long period of time and can be used for continuous enzymatic reactions with substrate.

44 Claims, No Drawings

United States Patent

[19]

4,258,133

[11]

Mar. 24, 1981

Mirabel et al.

- [54] ENZYME-SUPPORT COMPLEXES
- [75] Inventors: Bernard Mirabel, Odile Francou, Mellier, Plateau, both of France
- [73] Assignee: Rhone-Poulenc Industries, Paris, France
- [21] Appl. No.: 12,394
- [22] Filed: Feb. 15, 1979
- [30] Foreign Application Priority Data
- Feb. 16, 1978 [FR] France 79 0454
- Jan. 15, 1979 [FR] France 79 0360
- [51] Int. Cl. C12N 11/14
- [52] U.S. Cl. 435/176; 435/181
- [53] Field of Search 435/176, 181
- 12 Claims, No Drawings

References Cited

U.S. PATENT DOCUMENTS

3,518,538 7/1970 Meung et al. 435/176

3,518,539 7/1970 Meung et al. 435/176

4,034,139 7/1978 Marzagli et al. 435/176 X

4,119,648 10/1978 Durand et al. 435/176

Primary Examiner—David M. Naff

ABSTRACT

Enzyme-support complexes in which the enzymes are bound by covalent bonding to at least one reactive group of a support, the support being supported by at least one ester bond. The complexes are obtained by reacting an insoluble inorganic support having hydroxyl groups with a compound formed of an organic group and an ester group, the ester group being in function and at least one reactive function, to which the enzyme is then bonded.

United States Patent

[19]

4,260,680

[11]

Apr. 7, 1981

Muramatsu et al.

- [54] METHOD AND APPARATUS FOR THE MEASUREMENT OF GLUCOSE CONTENT
- [75] Inventors: Kazuo Muramatsu, Masahiko Muramatsu, both of Japan
- [73] Assignee: Mitsubishi Chemical Industries, Ltd., Tokyo, Japan
- [21] Appl. No.: 949,130
- [22] Filed: Oct. 6, 1978
- [30] Foreign Application Priority Data
- Oct. 22, 1977 [JP] Japan 57/12102
- [51] Int. Cl. C12Q 1/44; C12Q 1/26; C12Q 1/28
- [52] U.S. Cl. 435/14; 435/176; 435/180; 435/181; 435/191; 206/1 T; 204/195 B
- [53] Field of Search 435/14, 176, 206, 191; 195/103.5 R; 103.5 C; 127; 204/195 B, 1 T
- References Cited
- U.S. PATENT DOCUMENTS
- 3,421,085 1/1969 Schaller et al. 435/14 X
- 3,502,790 9/1975 Clark et al. 435/14 X
- 3,937,615 2/1976 Clark et al. 435/14 X
- 4033,000 7/1977 Fischer 206/1 T X
- 4,085,509 4/1978 Fric 206/194 B
- OTHER PUBLICATIONS
- Ramaswamy et al., *Chemical Abstracts*, 80 (105553), (1974)
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- Ramaswamy et al., *Indian J. Biochem. Biophys.*, 10(2), 183, (1973)
- Bloxam, *Biochem. Med.*, 10(1), 61-69 (1974)
- Primary Examiner—Alvin E. Tarcholitz
- McClelland & Maser
- ABSTRACT
- A method and apparatus for measuring the glucose content in a liquid sample, the method comprising: (a) moving through a column of at least one ion exchange resin and a column of immobilized glucose oxidase and then determining the amount of hydrogen peroxide produced by contacting the sample with glucose oxidase.

11 Claims, 7 Drawing Figures

United States Patent

[19]

4,250,260

[11]

Feb. 10, 1981

Rohrbach et al.

- [54] REGENERATION OF AN IMMOBILIZED ENZYME SYSTEM
- [75] Inventors: Ronald P. Rohrbach, Forest Lake, Minn.; Joseph Levy, Deerfield Beach, Fla.
- [73] Assignee: UOP Inc., Des Plaines, Ill.
- [21] Appl. No.: 68,803
- [22] Filed: Aug. 22, 1979
- [51] Int. Cl. C12M 11/14; C12M 11/08; C12M 11/06; B01J 31/40
- [52] U.S. Cl. 435/176; 252/413; 252/413.1
- [53] Field of Search 252/413, 414, 418, 428, 435/180, 181, 182, 174-177
- References Cited
- U.S. PATENT DOCUMENTS
- 3,761,357 9/1973 Eppe et al. 435/181
- 3,761,358 9/1973 Eppe et al. 435/181
- 4,113,560 9/1978 Fujio et al. 435/180
- 4,141,857 2/1979 Levy et al. 252/430
- Primary Examiner—P. E. Konopka
- Attorney, Agent, or Firm—James R. Houston, Jr.; Raymond H. Nelson, William H. Page, II
- ABSTRACT
- A method for regenerating an immobilized enzyme system, comprising: (a) moving excess solid, treating the system with a bifunctional organic reagent which furnishes a pendant group, removing excess of said bifunctional reagent, and immobilizing the enzyme on the solid support.

7 Claims, 1 Drawing Figure

United States Patent

[19]

4,273,865

Jun. 16, 1981

von Stetten et al.

- [54] INSOLUBILIZED BIOCHEMICAL MATERIALS
- [75] Inventors: Otto von Stetten, Rodgau; Helmut Schmidt, Wuerzburg, both of Fed. Rep. of Germany
- [73] Assignee: Byk-Mallinckrodt Chemische Produkte GmbH, Wuerzburg, Fed. Rep. of Germany
- [21] Appl. No.: 977,446
- [22] Filed: Dec. 26, 1978
- [30] Foreign Application Priority Data
- Dec. 28, 1977 [DE] Fed. Rep. of Germany 258,507
- [51] Int. Cl. G01N 33/94; C12N 11/14
- [52] U.S. Cl. 435/7; 260/112 R; 435/28; 435/176; 435/181
- References Cited
- Field of Search 435/7, 28, 174, 176, 435/177, 181; 414/12; 260/112 R
- U.S. PATENT DOCUMENTS
- 3,518,538 7/1970 Meung et al. 435/176
- 3,713,278 7/1973 Miller 435/176
- Primary Examiner—David M. Naff
- Attorney, Agent, or Firm—Koy J. Kosiernerman
- ABSTRACT
- Stabilized, insolubilized biochemical materials are prepared by immobilizing a biochemical material, such as an antigen, antibody, hormone, or enzyme, to a silicic acid heteropolycondensate layer which is applied to a mechanically stable support. The insolubilized biochemical materials are useful as reagents or adsorbents in radio-immuno assays or affinity chromatography.

27 Claims, No Drawings

United States Patent [19]

Cormier et al.

- | | | | | | |
|-------|---|------------------------|-------------------|----------------------|------------------|
| [74] | ENZYMATIC IMMOBILIZATION WITH A
DIPYRROMETHANE BRIDGE | 3,904,478 | 9/19/77 | Doan et al. | 195/63 |
| [75] | Investors: Richard A. Comar, St. Hubert;
Claude F. Gagnon, Repertoire, both
of Montreal | 4,004,126
4,111,340 | 8/9/77
9/19/78 | Koyan et al.
Hunt | 195/63
195/61 |
| [76] | Investor: St. Hubert | 4,111,340 | 9/19/78 | Hunt | 195/61 |
| [77] | Assignee: St. Hubert Sugars Limited, Montreal,
Canada | | | | |
| [78] | Assignee: St. Hubert Sugars Limited, Montreal,
Canada | | | | |
| [79] | Assignee: St. Hubert Sugars Limited, Montreal,
Canada | | | | |
| [80] | Assignee: St. Hubert Sugars Limited, Montreal,
Canada | | | | |
| [81] | Assignee: St. Hubert Sugars Limited, Montreal,
Canada | | | | |
| [82] | Assignee: St. Hubert Sugars Limited, Montreal,
Canada | | | | |
| [83] | Assignee: St. Hubert Sugars Limited, Montreal,
Canada | | | | |
| [84] | Assignee: St. Hubert Sugars Limited, Montreal,
Canada | | | | |
| [85] | Assignee: St. Hubert Sugars Limited, Montreal,
Canada | | | | |
| [86] | Assignee: St. Hubert Sugars Limited, Montreal,
Canada | | | | |
| [87] | Assignee: St. Hubert Sugars Limited, Montreal,
Canada | | | | |
| [88] | Assignee: St. Hubert Sugars Limited, Montreal,
Canada | | | | |
| [89] | Assignee: St. Hubert Sugars Limited, Montreal,
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| [90] | Assignee: St. Hubert Sugars Limited, Montreal,
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| [91] | Assignee: St. Hubert Sugars Limited, Montreal,
Canada | | | | |
| [92] | Assignee: St. Hubert Sugars Limited, Montreal,
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| [93] | Assignee: St. Hubert Sugars Limited, Montreal,
Canada | | | | |
| [94] | Assignee: St. Hubert Sugars Limited, Montreal,
Canada | | | | |
| [95] | Assignee: St. Hubert Sugars Limited, Montreal,
Canada | | | | |
| [96] | Assignee: St. Hubert Sugars Limited, Montreal,
Canada | | | | |
| [97] | Assignee: St. Hubert Sugars Limited, Montreal,
Canada | | | | |
| [98] | Assignee: St. Hubert Sugars Limited, Montreal,
Canada | | | | |
| [99] | Assignee: St. Hubert Sugars Limited, Montreal,
Canada | | | | |
| [100] | Assignee: St. Hubert Sugars Limited, Montreal,
Canada | | | | |

[58] Field of Search 195/63, 68, D.

D

- | | | |
|-----------|----------------|----------|
| 3,198,781 | Benesi et al. | 260/117 |
| 4,965 | Meising et al. | 195/63 X |
| 3,519,538 | Meising et al. | 195/63 X |
| 3,846,306 | Barber et al. | 195/63 X |
| 1,117,974 | Coating | 195/68 |
| 3,884,761 | Coating | 195/68 |

United States Patent (1)

Cabane et al.

- | | | | | | |
|-------|---|-----------|---------|-------|---------|
| [64] | PROCESS FOR BIOLOGICAL DENSIFICATION OF EFFLUENTS | 3,444,289 | 5/1/79 | Jenks | 210/DIG |
| [65] | PROCESS FOR BIOLOGICAL DENSIFICATION OF EFFLUENTS | 3,397,632 | 11/1/79 | Kenpe | 210/DIG |
| [66] | PROCESS FOR BIOLOGICAL DENSIFICATION OF EFFLUENTS | 3,397,633 | 11/1/79 | Kenpe | 210/DIG |
| [75] | Inventors: Bruno Cahane, St. Cloud, Joel Vergnaud, Argentat, both of France | 4,043,946 | 8/1/77 | Beck | 210/197 |
| [76] | Assignee: Procter & Gamble Co., Cincinnati, Ohio | 4,104,167 | 1/1/78 | Beck | 210/197 |
| [77] | Assignee: Procter & Gamble Co., Cincinnati, Ohio | 4,104,167 | 1/1/78 | Beck | 210/197 |
| [78] | Assignee: Procter & Gamble Co., Cincinnati, Ohio | 4,104,167 | 1/1/78 | Beck | 210/197 |
| [79] | Assignee: Procter & Gamble Co., Cincinnati, Ohio | 4,104,167 | 1/1/78 | Beck | 210/197 |
| [80] | Assignee: Procter & Gamble Co., Cincinnati, Ohio | 4,104,167 | 1/1/78 | Beck | 210/197 |
| [81] | Assignee: Procter & Gamble Co., Cincinnati, Ohio | 4,104,167 | 1/1/78 | Beck | 210/197 |
| [82] | Assignee: Procter & Gamble Co., Cincinnati, Ohio | 4,104,167 | 1/1/78 | Beck | 210/197 |
| [83] | Assignee: Procter & Gamble Co., Cincinnati, Ohio | 4,104,167 | 1/1/78 | Beck | 210/197 |
| [84] | Assignee: Procter & Gamble Co., Cincinnati, Ohio | 4,104,167 | 1/1/78 | Beck | 210/197 |
| [85] | Assignee: Procter & Gamble Co., Cincinnati, Ohio | 4,104,167 | 1/1/78 | Beck | 210/197 |
| [86] | Assignee: Procter & Gamble Co., Cincinnati, Ohio | 4,104,167 | 1/1/78 | Beck | 210/197 |
| [87] | Assignee: Procter & Gamble Co., Cincinnati, Ohio | 4,104,167 | 1/1/78 | Beck | 210/197 |
| [88] | Assignee: Procter & Gamble Co., Cincinnati, Ohio | 4,104,167 | 1/1/78 | Beck | 210/197 |
| [89] | Assignee: Procter & Gamble Co., Cincinnati, Ohio | 4,104,167 | 1/1/78 | Beck | 210/197 |
| [90] | Assignee: Procter & Gamble Co., Cincinnati, Ohio | 4,104,167 | 1/1/78 | Beck | 210/197 |
| [91] | Assignee: Procter & Gamble Co., Cincinnati, Ohio | 4,104,167 | 1/1/78 | Beck | 210/197 |
| [92] | Assignee: Procter & Gamble Co., Cincinnati, Ohio | 4,104,167 | 1/1/78 | Beck | 210/197 |
| [93] | Assignee: Procter & Gamble Co., Cincinnati, Ohio | 4,104,167 | 1/1/78 | Beck | 210/197 |
| [94] | Assignee: Procter & Gamble Co., Cincinnati, Ohio | 4,104,167 | 1/1/78 | Beck | 210/197 |
| [95] | Assignee: Procter & Gamble Co., Cincinnati, Ohio | 4,104,167 | 1/1/78 | Beck | 210/197 |
| [96] | Assignee: Procter & Gamble Co., Cincinnati, Ohio | 4,104,167 | 1/1/78 | Beck | 210/197 |
| [97] | Assignee: Procter & Gamble Co., Cincinnati, Ohio | 4,104,167 | 1/1/78 | Beck | 210/197 |
| [98] | Assignee: Procter & Gamble Co., Cincinnati, Ohio | 4,104,167 | 1/1/78 | Beck | 210/197 |
| [99] | Assignee: Procter & Gamble Co., Cincinnati, Ohio | 4,104,167 | 1/1/78 | Beck | 210/197 |
| [100] | Assignee: Procter & Gamble Co., Cincinnati, Ohio | 4,104,167 | 1/1/78 | Beck | 210/197 |

[36] Field of Search 210/2, 11, 210/150, 151; 195/DIG. 28, 116, 3

[36]

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| 1944/00 | 12/1971 | Owen | 1952/16 |
| 1947/00 | 12/1971 | Bishop | 210/18 |
| 1947/50 | 1/1971 | Swage | 210/16 |
| 1948/00 | 1/1971 | Swage | 210/17 |
| 1973/28 | 4/1973 | Swage | 210/11 |
| 1949/45 | 1/1973 | Kerec | 210/12 |
| 1949,377 | 1/1973 | Kerec | 210/11 |
| 1952,377 | 8/1974 | Hashimoto | 210/11 |

100

[54] BIOLOGICALLY ACTIVE MEMBRANE MATERIAL

[73] Inventors: Chung Jung Lai, Watertown; Stanley M. Galvin, Norwood, both of Mass.; Milligear Corporation, Bedford, Mass.

[71] Assignee: Milligear Corporation, Bedford, Mass.

[21] Appl. No.: 844,746

[22] Filed: May 10, 1976

Related U.S. Application Data

[63] Continuation of Ser. No. 503,654, Sept. 6, 1974, abandoned.

[51] Int. Cl. 2: C07G 7/00; C07G 7/02; C01N 31/00

[52] U.S. Cl.: 195/103.3 R; 195/127; 195/63; 195/103.3 A; 195/103.3 B; 195/103.3 C; 4472

[58] Field of Search: 195/63, 68, DIG. 11, 195/103.3 R, 127, 424/94, 2, 427/338, 414, 439; 2802.3 A, 6

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18 Claims, 5 Drawing Figures

United States Patent

Thang et al.

[54] IMMOBILIZED RIBONUCLEASE AND ALKALINE PHOSPHATASE

[73] Inventors: Minh-Viet Thang, Rapazus; Azzale Gualani, Iron Treehills, Frensch, both of France

[71] Assignee: Chazy S. A., Paris, France

[21] Appl. No.: 678,459

[22] Filed: Apr. 19, 1976

Foreign Application Priority Data

Apr. 21, 1975 France 75.1367

[51] Int. Cl. 2: C07G 1/00; C12N 1/00

[52] U.S. Cl.: 195/68; 195/DIG. 11; 195/16

[58] Field of Search: 195/63, 68, DIG. 11, 195/116, 20 N

[56] References Cited

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Thang, V. T., Membrane on a Collision Matrix. Science, vol. 180, 1965, (pp. 578-760).
Thang, et al., Observations on the Activity of Enzymes after Filtration on (and through) a Nitrocellulose Membrane. Biochemical and Biophysical Res. Comm., vol. 68, 1976, (pp. 118-120).
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Zaborzky, O., Immobilized Enzymes. CRC Press, Inc., Cleveland, Ohio, 1973 (pp. 73, 80, 83, 180-182, 151 & 158).

Primary Examiner—David M. Naff

ABSTRACT

A composite membrane structure for immobilizing biologically active materials is disclosed. The structure includes a porous support material (such as nitrocellulose) coated with a microporous polymeric membrane with a thin layer of an inert proteanaceous material, such as zein or collagen, so that the resultant coated membrane retains intercommunicating capillary pores in the porous support material. A biologically active material is carried out by contacting the coated membrane with the biologically active material in solution and drying. Biologically active materials immobilized on the membrane can be used to perform biological reactions and to store the material in carrying out tests for glucose and ure acid.

United States Patent

Thompson et al.

[54] PROCESS FOR PRODUCING DEVICES USING MIXED IMMOBILIZED ENZYMES

[73] Inventors: Kenneth N. Thompson, Peach, N. C.; A. Johnson, both of Clinton, Iowa

[71] Assignee: Standard Brands Incorporated, New York, N.Y.

[21] Appl. No.: 773,450

[22] Filed: Mar. 2, 1977

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 503,975, Aug. 26, 1974, Pat. No. 4,001,137.

[51] Int. Cl. 2: C12D 13/02

[52] U.S. Cl.: 195/31 R; 195/13; 195/DIG. 11

[58] Field of Search: 195/31 R; 195/13; 195/DIG. 11

[56] References Cited

3,803,097 11/1974 Harvey et al. 195/31 R
3,849,233 11/1974 Thompson et al. 195/31 R
4,001,137 3/1977 Thompson et al. 195/31 R
Primary Examiner—Raymond N. Jones
Assistant Examiner—Thomas G. Wiseman

[*] Notice: The position of the term of this patent subsequent to Mar. 8, 1994, has been declared.

Process for converting starch to dextrose wherein a partially hydrolyzed starch solution containing at least one enzyme is mixed with a solution of another enzyme system under conditions whereby substantially complete conversion of the starch to dextrose is achieved. The enzyme system comprises immobilized enzymes on a porous support material and a liquid group consisting of soluble amylase, amylase, immobilized alpha-amylase and mixtures thereof.

4 Claims, No Drawings

United States Patent

Iwawaki et al.

[54] METHOD OF GELLING MICROBIAL MYCELA

[73] Inventors: Tsuneko Iwawaki, Hiro; Toshihiko Kikuchi, Tokyo, both of Japan

[71] Assignee: Snow Brand Milk Products Co., Ltd., Sapporo, Japan

[21] Appl. No.: 89,1217

[22] Filed: Mar. 28, 1978

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 780,496, Mar. 2, 1977, abandoned

[51] Int. Cl. 2: B01D 1/00

[52] U.S. Cl.: 195/63; 195/68; 195/127; 195/16; 195/116, 20 N

[58] Field of Search: 195/63, 68, DIG. 11, 195/DIG. 11

[56] References Cited

3,983,321 9/1976 Amos et al. 195/68 X
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[58] Field of Search: 195/37 R, 68, 68, DIG. 11, 195/115, 13
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3,849,233 11/1974 Thompson et al. 195/31 R
4,001,137 3/1977 Thompson et al. 195/31 R
Primary Examiner—Raymond N. Jones
Assistant Examiner—Thomas G. Wiseman

ABSTRACT
Process for converting starch to dextrose wherein a partially hydrolyzed starch solution containing at least one enzyme is mixed with a solution of another enzyme system under conditions whereby substantially complete conversion of the starch to dextrose is achieved. The enzyme system comprises immobilized enzymes on a porous support material and a liquid group consisting of soluble amylase, amylase, immobilized alpha-amylase and mixtures thereof.

4 Claims, No Drawings

ABSTRACT
The disclosed method involves adding a crosslinking agent to a mixture of a microbial enzyme (treating the mixture and then thawing the frozen mycelia. The resulting gelation immobilizes the intracellular enzyme in the mycelia. The gel may be used in a liquid enzyme industry as a highly active enzyme preparation.

9 Claims, No Drawings

United States Patent

[11] 4,272,617
[45] Jun. 9, 1981

United States Patent
Takahashi

[11] 3,950,222
[45] Apr. 13, 1976

[54] IMMOBILIZATION OF ENZYMES OR BACTERIA CELLS

[75] Inventors: Isao Kaetsu, Minoru Kumakura; Masaru Yoshida, all of Takasaki, Japan

[73] Assignee: Japan Atomic Energy Research Institute, Tokyo, Japan

[21] Appl. No.: 80,687

[22] Filed: Jul. 26, 1979

[30] Foreign Application Priority Data

[51] Int. Cl. 1969 C12N 1/04

[52] Field of Search: C12N 1/04, 1/02, 1/00, 1/01, 1/03, 1/04, 1/05, 1/06, 1/07, 1/08, 1/09, 1/10, 1/11, 1/12, 1/13, 1/14, 1/15, 1/16, 1/17, 1/18, 1/19, 1/20, 1/21, 1/22, 1/23, 1/24, 1/25, 1/26, 1/27, 1/28, 1/29, 1/30, 1/31, 1/32, 1/33, 1/34, 1/35, 1/36, 1/37, 1/38, 1/39, 1/40, 1/41, 1/42, 1/43, 1/44, 1/45, 1/46, 1/47, 1/48, 1/49, 1/50, 1/51, 1/52, 1/53, 1/54, 1/55, 1/56, 1/57, 1/58, 1/59, 1/60, 1/61, 1/62, 1/63, 1/64, 1/65, 1/66, 1/67, 1/68, 1/69, 1/70, 1/71, 1/72, 1/73, 1/74, 1/75, 1/76, 1/77, 1/78, 1/79, 1/80, 1/81, 1/82, 1/83, 1/84, 1/85, 1/86, 1/87, 1/88, 1/89, 1/90, 1/91, 1/92, 1/93, 1/94, 1/95, 1/96, 1/97, 1/98, 1/99, 2/00, 2/01, 2/02, 2/03, 2/04, 2/05, 2/06, 2/07, 2/08, 2/09, 2/10, 2/11, 2/12, 2/13, 2/14, 2/15, 2/16, 2/17, 2/18, 2/19, 2/20, 2/21, 2/22, 2/23, 2/24, 2/25, 2/26, 2/27, 2/28, 2/29, 2/30, 2/31, 2/32, 2/33, 2/34, 2/35, 2/36, 2/37, 2/38, 2/39, 2/40, 2/41, 2/42, 2/43, 2/44, 2/45, 2/46, 2/47, 2/48, 2/49, 2/50, 2/51, 2/52, 2/53, 2/54, 2/55, 2/56, 2/57, 2/58, 2/59, 2/60, 2/61, 2/62, 2/63, 2/64, 2/65, 2/66, 2/67, 2/68, 2/69, 2/70, 2/71, 2/72, 2/73, 2/74, 2/75, 2/76, 2/77, 2/78, 2/79, 2/80, 2/81, 2/82, 2/83, 2/84, 2/85, 2/86, 2/87, 2/88, 2/89, 2/90, 2/91, 2/92, 2/93, 2/94, 2/95, 2/96, 2/97, 2/98, 2/99, 3/00, 3/01, 3/02, 3/03, 3/04, 3/05, 3/06, 3/07, 3/08, 3/09, 3/10, 3/11, 3/12, 3/13, 3/14, 3/15, 3/16, 3/17, 3/18, 3/19, 3/20, 3/21, 3/22, 3/23, 3/24, 3/25, 3/26, 3/27, 3/28, 3/29, 3/30, 3/31, 3/32, 3/33, 3/34, 3/35, 3/36, 3/37, 3/38, 3/39, 3/40, 3/41, 3/42, 3/43, 3/44, 3/45, 3/46, 3/47, 3/48, 3/49, 3/50, 3/51, 3/52, 3/53, 3/54, 3/55, 3/56, 3/57, 3/58, 3/59, 3/60, 3/61, 3/62, 3/63, 3/64, 3/65, 3/66, 3/67, 3/68, 3/69, 3/70, 3/71, 3/72, 3/73, 3/74, 3/75, 3/76, 3/77, 3/78, 3/79, 3/80, 3/81, 3/82, 3/83, 3/84, 3/85, 3/86, 3/87, 3/88, 3/89, 3/90, 3/91, 3/92, 3/93, 3/94, 3/95, 3/96, 3/97, 3/98, 3/99, 4/00, 4/01, 4/02, 4/03, 4/04, 4/05, 4/06, 4/07, 4/08, 4/09, 4/10, 4/11, 4/12, 4/13, 4/14, 4/15, 4/16, 4/17, 4/18, 4/19, 4/20, 4/21, 4/22, 4/23, 4/24, 4/25, 4/26, 4/27, 4/28, 4/29, 4/30, 4/31, 4/32, 4/33, 4/34, 4/35, 4/36, 4/37, 4/38, 4/39, 4/40, 4/41, 4/42, 4/43, 4/44, 4/45, 4/46, 4/47, 4/48, 4/49, 4/50, 4/51, 4/52, 4/53, 4/54, 4/55, 4/56, 4/57, 4/58, 4/59, 4/60, 4/61, 4/62, 4/63, 4/64, 4/65, 4/66, 4/67, 4/68, 4/69, 4/70, 4/71, 4/72, 4/73, 4/74, 4/75, 4/76, 4/77, 4/78, 4/79, 4/80, 4/81, 4/82, 4/83, 4/84, 4/85, 4/86, 4/87, 4/88, 4/89, 4/90, 4/91, 4/92, 4/93, 4/94, 4/95, 4/96, 4/97, 4/98, 4/99, 5/00, 5/01, 5/02, 5/03, 5/04, 5/05, 5/06, 5/07, 5/08, 5/09, 5/10, 5/11, 5/12, 5/13, 5/14, 5/15, 5/16, 5/17, 5/18, 5/19, 5/20, 5/21, 5/22, 5/23, 5/24, 5/25, 5/26, 5/27, 5/28, 5/29, 5/30, 5/31, 5/32, 5/33, 5/34, 5/35, 5/36, 5/37, 5/38, 5/39, 5/40, 5/41, 5/42, 5/43, 5/44, 5/45, 5/46, 5/47, 5/48, 5/49, 5/50, 5/51, 5/52, 5/53, 5/54, 5/55, 5/56, 5/57, 5/58, 5/59, 5/60, 5/61, 5/62, 5/63, 5/64, 5/65, 5/66, 5/67, 5/68, 5/69, 5/70, 5/71, 5/72, 5/73, 5/74, 5/75, 5/76, 5/77, 5/78, 5/79, 5/80, 5/81, 5/82, 5/83, 5/84, 5/85, 5/86, 5/87, 5/88, 5/89, 5/90, 5/91, 5/92, 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7/59, 7/60, 7/61, 7/62, 7/63, 7/64, 7/65, 7/66, 7/67, 7/68, 7/69, 7/70, 7/71, 7/72, 7/73, 7/74, 7/75, 7/76, 7/77, 7/78, 7/79, 7/80, 7/81, 7/82, 7/83, 7/84, 7/85, 7/86, 7/87, 7/88, 7/89, 7/90, 7/91, 7/92, 7/93, 7/94, 7/95, 7/96, 7/97, 7/98, 7/99, 8/00, 8/01, 8/02, 8/03, 8/04, 8/05, 8/06, 8/07, 8/08, 8/09, 8/10, 8/11, 8/12, 8/13, 8/14, 8/15, 8/16, 8/17, 8/18, 8/19, 8/20, 8/21, 8/22, 8/23, 8/24, 8/25, 8/26, 8/27, 8/28, 8/29, 8/30, 8/31, 8/32, 8/33, 8/34, 8/35, 8/36, 8/37, 8/38, 8/39, 8/40, 8/41, 8/42, 8/43, 8/44, 8/45, 8/46, 8/47, 8/48, 8/49, 8/50, 8/51, 8/52, 8/53, 8/54, 8/55, 8/56, 8/57, 8/58, 8/59, 8/60, 8/61, 8/62, 8/63, 8/64, 8/65, 8/66, 8/67, 8/68, 8/69, 8/70, 8/71, 8/72, 8/73, 8/74, 8/75, 8/76, 8/77, 8/78, 8/79, 8/80, 8/81, 8/82, 8/83, 8/84, 8/85, 8/86, 8/87, 8/88, 8/89, 8/90, 8/91, 8/92, 8/93, 8/94, 8/95, 8/96, 8/97, 8/98, 8/99, 9/00, 9/01, 9/02, 9/03, 9/04, 9/05, 9/06, 9/07, 9/08, 9/09, 9/10, 9/11, 9/12, 9/13, 9/14, 9/15, 9/16, 9/17, 9/18, 9/19, 9/20, 9/21, 9/22, 9/23, 9/24, 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TISSUE CULTURE

This profile includes processes, compositions and media for the in vitro propagation or maintenance of undifferentiated plant or animal cells, i.e., cell lines that are not organized tissue. The culture of cell lines may be on a surface or in suspension. Also included are apparatus adapted for the growth of differentiated or undifferentiated animal or plant cells, tissue or viruses.

INCLUDED IN THIS PROFILE ARE ALL OF THE PATENTS FROM:

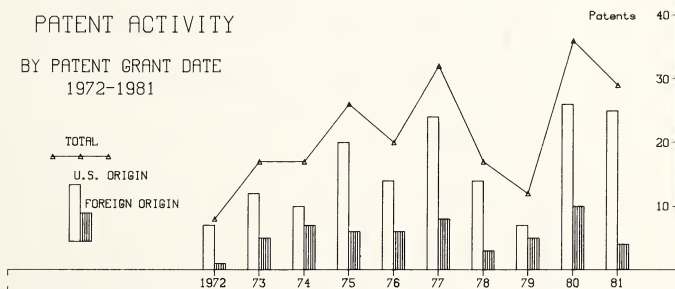
Class 435, Subclasses 240, 241,
284, 285, 286

ACTIVITY INDICES (1979-1981)

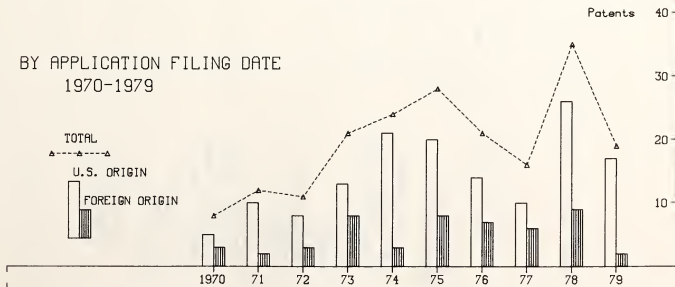
GROWTH	36.0%
FOREIGN SHARE	24.7%
CORPORATE OWNED	76.6%
GOVERNMENT OWNED	9.1%
U.S. OWNED OF FOREIGN	10.5%

PATENT ACTIVITY

BY PATENT GRANT DATE
1972-1981



BY APPLICATION FILING DATE
1970-1979



TISSUE CULTURE - PART 2A

PATENT ACTIVITY (1/63-12/81) BY DATE OF PATENT GRANT

		NUMBER OF PATENTS														PAGE A	
		63-67	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	TOTAL
TOTAL		19	5	8	7	8	8	17	17	26	20	32	17	12	36	29	261
U.S. ORIGIN		14	2	8	4	7	7	12	10	20	14	24	14	7	26	25	194
FOREIGN ORIGIN		5	3	3	3	1	1	5	7	6	6	8	3	5	10	4	67
UNITED KINGDOM		2	2	2	1	1	1	1	4	1	1	2	1	1	2	1	20
JAPAN											2	1	1	1	4		12
WEST GERMANY		1		1					1	2	1		1		1	2	6
FRANCE								1	1	1	1	4			1		9
SWITZERLAND								1	1	1					1		5
SWEDEN		1						1	1			1			1		5
CANADA			1														5
AUSTRIA							1	1							1	1	2
CZECHOSLOVAKIA		1															1
INDIA																	1
ITALY								1					1				1
U.S. ORIGIN		14	2	8	4	7	7	12	10	20	14	24	14	7	26	25	194
U.S. CORP. OWNED		12	2	7	3	5	7	7	7	16	10	19	13	3	20	18	149
U.S. GOVT. OWNED				1		1	1	1	2	1	3	1	1	1	3	2	15
U.S. INDIV. OWNED		2			1	1		3	1	3	4	2	1	2	3	5	28
FOREIGN OWNED								1	1					1			2
FOREIGN ORIGIN		5	3	3	3	1	1	5	7	6	6	8	3	5	10	4	67
U.S. OWNED		5	3	2	1	1	1	1	2	2	2	1	2	2	2	2	12
FOREIGN OWNED								4	5	6	4	7	1	5	8	4	55
FOREIGN CORP. OWNED		2	3	2			1	2	3	5	4	6	1	5	8	2	44
FOREIGN GOVT. OWNED																	1
FOREIGN INDIV. OWNED		3						2	2	1		1				1	10

PATENT ACTIVITY (PATENTS GRANTED 1/67-12/81) BY DATE OF PATENT APPLICATION

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TISSUE CULTURE

Organizational Patenting: Ranked

<u>NO. OF</u> <u>PATENTS</u>	<u>ASSIGNEES WITH 2 OR MORE PATENTS (1969-1981)</u>
19	MONSANTO CO.
16	MERCK & CO., INC.
10	MASSACHUSETTS INSTITUTE OF TECHNOLOGY
7	BURROUGHS WELLCOME CO.
6	UNITED STATES OF AMERICA, HEALTH, EDUCATION AND WELFARE
5	UNITED STATES OF AMERICA
4	HOFFMANN-LA ROCHE, INC.
4	OLYMPUS OPTICAL CO., LTD.
3	AB KABI
3	AMERICAN CYANAMID CO.
3	BEECHAM GROUP LTD.
3	CHEMAP AG
3	DOW CHEMICAL CO.
3	FLOW LABORATORIES, INC.
3	INSTRUMENTATION LABORATORY, INC.
3	MILES LABORATORIES INC.
3	NATIONAL RESEARCH DEVELOPMENT CORP.
3	UNIVERSITY OF MINNESOTA, THE REGENTS OF
3	WISTAR INSTITUTE
2	ABBOTT LABORATORIES
2	AMERICAN HOME PRODUCTS CORP.
2	BECTON, DICKINSON AND CO.
2	CALIFORNIA INSTITUTE OF TECHNOLOGY
2	CORNELL RESEARCH FOUNDATION INC.
2	DATA PACKAGING CORP.
2	DUKE UNIVERSITY INC.
2	ELI LILLY AND CO.
2	GODO SHUSEI KABUSHIKI KAISHA
2	GTE LABORATORIES INC.
2	MAX-PLANCK-GESELLSCHAFT ZUR FORDERUNG DER WISSENSCHAFTEN E.V.
2	MICROBIOLOGICAL ASSOCIATES, INC.
2	RESEARCH CORP.
2	SLOAN-KETTERING INSTITUTE FOR CANCER RESEARCH
2	UNITED STATES OF AMERICA, NAVY
2	UPJOHN CO.
2	VIRTIS CO., INC.
2*	INSTITUT ARMAND FRAPPIER

*Composite Total. See Appendix A.

ORGANIZATIONAL PATENTING (1/69-12/81) - ALPHA LISTING

- AB BIOTEC
3853711 - INSTALLATION FOR AUTOMATION OF MICROBIOLOGICAL WORK TECHNIQUES
- ABBOTT LABORATORIES
3843454 - FLOW THROUGH TISSUE CULTURE PROPAGATOR
3930944 - UROKINASE PRODUCTION
- AB KABI
3953290 - POLYPEPTIDES AS VITRO ACTIVE CELL GROWTH ENHANCING FACTORS AND METHODS OF USE
4058512 - SYNTHETIC PEPTIDES HAVING GROWTH PROMOTING ACTIVITY
4235772 - NOVEL PEPTIDES HAVING GROWTH PROMOTING ACTIVITY
- AGENCE NATIONALE DE VALORISATION DE LA RECHERCHE (ANVAR)
4003156 - PROCESS FOR OBTAINING VARIANTS OF PLANTS WITH IMPROVED CHARACTERISTICS
- ALLIED CHEMICAL CORPORATION
3743480 - STERILIZATION OF BIOLOGICAL FLUIDS
- ALZA CORPORATION
3730835 - NOVEL DEVICE COATED WITH A PROSTAGLANDIN AND PREPARATION THEREOF
- AMERICAN CYANAMID COMPANY
3420743 - HARVESTING BIOLOGICALS FROM EGGS
3468520 - COMBINATION AGITATION AND TRANSFER UNIT FOR SUSPENDED CELLS
3702605 - CELL DISPERSAL METHOD FOR MONKEY KIDNEY TISSUE
- AMERICAN HOME PRODUCTS CORPORATION
3422391 - ATTENUATED INFECTIOUS VACCINE AND METHOD OF PRODUCING SAME
3882233 - METHODS OF INCREASING PRODUCTION OF PITUITARY HORMONES
- BATTELLE-INSTITUTE E. V.
4225671 - PROCESS FOR THE IN-VITRO BIOSYNTHESIS OF HORMONES, ESPECIALLY INSULIN
- BAXTER TRAVENOL LABORATORIES, INC.
4229541 - IN VITRO CULTIVATION OF HORSESHOE CRAB AMEBOCYTES
- BECTON, DICKINSON AND COMPANY
4238568 - ROLLER BOTTLE
4283495 - ROLLER BOTTLE
- BEECHAM GROUP LIMITED
4389003 - PROCESSES FOR THE CULTIVATION OF FUNGI
4244413 - CELL CULTURE METHOD
4224413 - CELL CULTURE METHOD
- BEHRINGWERKE AKTIENGESELLSCHAFT
3886270 - INTRAVENOUSLY TOLERATED ANTI-DIPHTHERIA AND ANTI-HEPATITIS VACCINE, ITS PREPARATION AND ITS USE FOR IMMUNIZATION
- BIO-RESPONSE, INC.
4084006 - METHOD FOR THE CONTINUOUS MASS IN VITRO SUSPENSION CULTURE OF CELLS
- BRITISH PETROLEUM COMPANY LIMITED
3816960 - METHOD FOR GROWING PLANTS
- BURROUGHS WELLCOME CO.
3520972 - FELINE VIRUS VACCINES OBTAINED BY PROPAGATION AND SERIAL PASSAGE ATTENUATION OF VIRULENT FELINE VIRUSES IN DIPLOID FELIN E EMBRYO TISSUE CELL SERIAL PASSAGE SUBCULTURE STRAINS

TISSUE CULTURE

- ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING
(CONTINUED)
- BURROUGHS WELLCOME CO.
3709782 - HETEROPLANT CELL LINES
3827943 - CULTURE APPARATUS
3935066 - CELL LINES
4021302 - CELL CULTURES
4021303 - PROCESS FOR PREPARING VACCINE
4203801 - CELL AND VIRUS CULTURE SYSTEMS
- CALIFORNIA INSTITUTE OF TECHNOLOGY
3910819 - TREATMENT OF SURFACES TO STIMULATE BIOLOGICAL CELL ADHESION AND GROWTH
4013507 - IONENE POLYMERS FOR SELECTIVELY INHIBITING THE VITRO GROWTH OF MALIGNANT CELLS
- CANADIAN PATENTS AND DEVELOPMENT LIMITED
3647633 - APPARATUS FOR THE CONTINUOUS PHASED CULTURING OF CELLS
- CETUS CORPORATION
4262090 - INTERFERON PRODUCTION
- CHEMAP AG
4173516 - DEVICE FOR CULTIVATING CELLS OF ANIMAL AND HUMAN TISSUES
4228242 - ARRANGEMENT FOR CULTIVATING CELLS OF ANIMAL AND HUMAN TISSUES
4259449 - METHOD OF CULTIVATING CELLS OF ANIMAL AND HUMAN TISSUES
- CHOAY S.A.
4017361 - PROCESS FOR OBTAINING CONTINUOUS LINES OF TUMORAL CELLS IN VITRO
- CONNAUGHT LABORATORIES LIMITED
3769415 - METHOD OF PREPARING A KILLED VACCINE FOR ORAL USE
- CORNELL RESEARCH FOUNDATION INC.
3783098 - HIGHLY POTENT VIABLE AND STABLE CELL-FREE VIRUS PREPARATIONS FROM CELLS INFECTED WITH CELL-ASSOCIATED VIRUSES AND METHODO FOR OBTAINING THE SAME
4306022 - COCOSA BEAN CELL CULTURE
- CROWN ZELLERBACH CORPORATION
3551554 - ENHANCING TISSUE PENETRATION OF PHYSIOLOGICALLY ACTIVE AGENTS WITH DMSO
- CURATORS OF THE UNIVERSITY OF MISSOURI
3941661 - ROLLER CULTURE BOTTLE INSERT
- CUTLER LABORATORIES INC.
4112068 - CANINE LUNG CELL STRAIN CULTURE SYSTEMS AND PROCESSES FOR THE CULTIVATION OF VIRUSES AND VACCINES THEREFROM
4012288 - TISSUE CULTURE CLUSTER DISH
4073695 - LEIGHTON TUBE
- DESIGN ALLIANCE, INC.
3955421 - PERIPHYTON SAMPLER FOR WATER QUALITY MONITORING
- DOW CHEMICAL COMPANY
3985266 - LIVE RABIES VIRUS VACCINE AND METHOD FOR THE PRODUCTION THEREOF
3887430 - CULTURE MEDIUM FOR TISSUE CULTURE TECHNIQUES
4072565 - PRODUCTION OF VIRUSES IN TISSUE CULTURE WITHOUT USE OF SERUM

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

- DR. RENTSCHLER ARZNEIMITTEL GMBH & CO.
4172013 - PROCESS FOR THE MASS GROWTH OF CELLS AND SYSTEM OF CHAMBERS FOR THE CARRYING OUT THEREOF
- DUKE UNIVERSITY INC.
3847749 - APPARATUS AND METHOD FOR RAPID HARVESTING OF ROLLER CULTURE SUPERNATANT FLUID
3993887 - METHOD FOR RAPID HARVESTING OF ROLLER CULTURE SUPERNATANT FLUID
- DYNASCIENCES CORPORATION
4198462 - RAPID ASPIRATION SYSTEM FOR CULTURE MEDIA
- EASTMAN KODAK COMPANY
4232121 - PROCESS FOR SELECTING METHINE DYES WHICH INHIBIT CELL GROWTH
- E. I. DU PONT DE NEMOURS AND COMPANY
3704546 - SYMBIOTIC FIXATION OF ATMOSPHERIC NITROGEN
- ELI LILLY AND COMPANY
3850748 - METHOD OF PRODUCING ANIMAL CELLS IN SUSPENSION CULTURE
3904480 - ENHANCED PRODUCTION OF PLASMINOGEN ACTIVATOR
- FLORIDA INSTITUTE OF TECHNOLOGY
4098646 - METHOD OF IN VITRO CULTIVATION OF PATHOGENIC ORGANISMS OF <I> TREPONEMA PALLIUM </I> B AND MEDIUM THEREFOR
- FLOW LABORATORIES INC.
3450598 - METHOD FOR CELL PROPAGATION
3553312 - PROCESS FOR PRODUCING RUBELLA-VIRUS HEMAGGLUTININATING ANTIGEN
3579423 - PREPARATION OF TISSUE CULTURE MEDIA
- FRAUNHOFER-GESELLSCHAFT ZUR FORDERUNG DER ANGEWANDTEN FORSCH
4243692 - PROCESS FOR THE PRODUCTION OF SILICIC ACID HETEROPOLYCONDENSATES USEFUL AS COATING MATERIALS
- FUJITAKE YOSHIDA
3870470 - BUBBLE-TYPE BLOOD OXYGENATOR WITH BAFFLES
- G. D. SEARLE & CO.
4038139 - CELL CULTURE MEDIUM
- GOO SHUSEI KABUSHIKI KAISHA
3930954 - NEUTRAL PROTEASE USEFUL FOR ANIMAL TISSUE AND CELL CULTURE
3948725 - NEUTRAL PROTEASE USEFUL FOR ANIMAL TISSUE AND CELL CULTURE
- GRAVI MECHANICS CO.
3911619 - SEED SPROUTER AND INSERT THEREFOR
- GREEN CROSS CORPORATION
4186253 - PERFUSATE FOR PRESERVING ORGAN TO BE TRANSPLANTED AND PRESERVING METHOD
- GTE LABORATORIES INCORPORATED
4038778 - TISSUE CULTURE TECHNIQUE FOR ASEQUAL PLANT REPRODUCTION AND A MEDIUM FOR USE THEREWITH
4052817 - PROCESS FOR STORING AND RECOVERING PLANT TISSUE
- HOFFMANN-LA ROCHE INC.
3668075 - GROWTH INHIBITORS OF SELECTIVE MYCOPLASMAS
3865689 - METHOD OF PRODUCING CARCINOEMBRYONIC ANTIGENS
3988205 - OPTICALLY ACTIVE CYCLOHEXANE DERIVATIVES
4241174 - INTERFERON ASSAY

TISSUE CULTURE

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

IMPERIAL CHEMICAL INDUSTRIES LIMITED
3503865 - CELL CULTURE SLIDES
INSTITUT ARMAND FRAPPIER
4144136 - APPARATUS FOR CELLULAR CULTURE
INSTITUTE FOR CANCER RESEARCH
3690310 - METHOD OF BIOASSAY OF FERTILITY AND CONTRACEPTIVE DRUGS
INSTITUT MERIEUX
4169761 - PROCESS FOR THE CULTIVATION OF VIRUSES
INSTITUT NATIONAL DE LA SANTE ET DE LA RECHERCHE MEDICALE
4064007 - PROCESS FOR OBTAINING AN ACTIVE PRODUCT FROM MAMMALIAN MACROPHAGES
INSTRUMENTATION LABORATORY, INC.
3887436 - CELL CULTURING SYSTEM
3948732 - CELL CULTURE ASSEMBLY
4033825 - CELL CULTURE SYSTEM
INTECH CORPORATION
3898045 - BLOOD OXYGENATOR
JOHNSON + JOHNSON
4055466 - CULTURE MEDIUM FOR TISSUE CULTURE TECHNIQUES
KITASATO INSTITUTE TOKYO, JAPAN
3492201 - METHOD OF ATTENUATION OF HOG CHOLERA VIRUS
LIMBRO CHEMICAL CO., INC.
3862886 - STERILE PLATE COMPONENT PACKAGE FOR CULTURE GROWING APPARATUS
L'INSTITUT ARMAND-FRAPPIER
4211843 - STRAIN OF MEASLES VIRUS AND PROCESS OF PRODUCING THE SAME
MARTIN-MARIETTA CORPORATION
3769176 - APPARATUS AND METHOD FOR MICROBIAL FERMENTATION IN A ZERO GRAVITY ENVIRONMENT
MASSACHUSETTS GENERAL HOSPITAL
4271145 - PROCESS FOR PRODUCING ANTIBODIES TO HEPATITIS VIRUS AND CELL LINES THEREFOR
MASSACHUSETTS
3884758 - TRIGLYCERIDE-ACCUMULATING CLONAL CELL LINE
3926723 - METHOD OF CONTROLLABLY RELEASING GLUCOSE TO A CELL CULTURE MEDIUM
4003789 - TRIGLYCERIDE-ACCUMULATING CLONAL CELL LINE
4016036 - PROCESS FOR SERIALLY CULTURING KERATINOCYTES
4036693 - TREATMENT OF CELL CULTURE MICROCARRIES
4066510 - ASSAY FOR MUTAGENESIS IN DIPILOTO HUMAN LYMPHOBLASTS
4189534 - CELL CULTURE MICROCARRIERS
4293654 - CELL CULTURE MICROCARRIERS
4302535 - ASSAY FOR MUTAGENESIS IN HETEROZYGOUS DIPLOID HUMAN LYMPHOBLASTS
4304866 - TRANSPLANTABLE SHEETS OF LIVING KERATINOUS TISSUE
MAX-PLANCK-GESELLSCHAFT ZUR FORDERUNG DER WISSENSCHAFTEN E.V.
3873423 - METHOD FOR CULTURING CELLS
3941662 - APPARATUS FOR CULTURING CELLS

TISSUE CULTURE

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

MEDITECH ENERGY AND ENVIRONMENTAL CORPORATION

3692848 - PROCESS FOR OXYGENATING BLOOD AND APPARATUS FOR CARRY OUT SAME

MERCK & CO., INC.

3616262 - APPARATUS AND METHOD FOR PROPAGATING VIRUSES IN THE EXTRA-EMBRYONIC FLUIDS OF EGGS

3839155 - CELL AND VACCINE PRODUCTION

3875000 - CELL CULTURE APPARATUS

3905865 - CELL AND VACCINE PRODUCTION

3933585 - PROCESS FOR PRODUCTION OF VACCINES

3965258 - PROCESS FOR PRODUCTION OF VACCINES

3976547 - CELL AND VACCINE PRODUCTION

4004981 - CELL REMOVING DEVICE

4040071 - CLARIFICATION OF XANTHAN GUM

4085359 - CELL REMOVING DEVICE

4127733 - CELL REMOVING DEVICE

4237039 - PRETREATMENT OF MICROCARRIERS FOR CELL CULTURE

4242487 - AUTOMATED VIRUS HARVESTING

4264739 - SPARGER FOR CELL CULTURE SYSTEM

4296204 - USE OF MOTIONLESS MIXER AS CELL CULTURE PROPAGATOR

4301250 - METHOD OF PRODUCING HEPATITIS B SURFACE ANTIGEN

MICROBIOLOGICAL ASSOCIATES, INC.

3429867 - SERUM SUBSTANTIALLY FREE FROM GAMMA GLOBULIN AND METHOD OF PREPARING SAME

3649464 - ASSAY AND CULTURE TRAY

MILES LABORATORIES INC.

3721764 - MICROBIOLOGICAL REACTION CHAMBER APPARATUS

3721764 - MICROBIOLOGICAL REACTION CHAMBER APPARATUS

3745091 - MICROBIOLOGICAL REACTION CHAMBER APPARATUS

MONSANTO COMPANY

3997396 - METHOD FOR THE IN VITRO PROPAGATION AND MAINTENANCE OF CELLS

4024020 - METHOD OF CELL CULTURE ON POLYACRYLONITRILE SURFACE

4059485 - ADAPTATION OF CELL LINES TO SUSPENSION CULTURE

4059486 - CELL CULTURE PROCESS

4087327 - MAMMALIAN CELL CULTURE PROCESS

4166768 - CONTINUOUS CELL CULTURE METHOD AND APPARATUS

4178209 - CONTINUOUS CELL CULTURE METHOD AND APPARATUS

4184916 - CONTINUOUS CELL CULTURE METHOD AND APPARATUS

4209887 - CONTINUOUS CELL CULTURE METHOD AND APPARATUS

4210718 - PRODUCTION OF TUMOR ANGIOGENESIS FACTOR BY CELL CULTURE

4210719 - PRODUCTION OF TUMOR ANGIOGENESIS FACTOR BY CELL CULTURE

4225670 - PRODUCTION OF TUMOR ANGIOGENESIS FACTOR BY CELL CULTURE

4229531 - PRODUCTION OF TUMOR ANGIOGENESIS FACTOR BY CELL CULTURE

4229532 - PRODUCTION OF TUMOR ANGIOGENESIS FACTOR BY CELL CULTURE

4266032 - METHOD OF CULTURING MICROCARRIER SUPPORTED CELLS

4268629 - PRODUCTION OF ANGIOGENIC FACTOR BY CELL CULTURE

4273871 - PRODUCTION OF ANGIOGENIC FACTOR BY CELL CULTURE

4289854 - CELL CULTURE METHOD AND APPARATUS

NATIONAL RESEARCH DEVELOPMENT CORPORATION

3853712 - CELL CULTURE SYSTEMS

3871954 - CELL LINES AND VIRUS CULTURE

4304865 - HARVESTING MATERIAL FROM MICRO-CULTURE PLATES

- ORGANIZATIONAL PATENTING (1/89-12/81) - - ALPHA LISTING
- NEW BRUNSWICK SCIENTIFIC CO., INC.
3508541 - APPARATUS AND METHOD FOR CULTIVATING CELLS, TISSUES AND THE LIKE
- NEW YORK UNIVERSITY
4307082 - METHOD FOR THE EXTRACTION OF A FACTOR THAT MEDIATES CONTACT INHIBITION OF CELL GROWTH
- NORDEN LABORATORIES, INC.
3515203 - VIRUS CULTURE AND METHOD
- OHIO STATE UNIVERSITY
3432595 - MELANOMA CELL LINE OF CANINE ORIGIN, ITS PROPAGATION AND USE, AND VACCINES DERIVED THERE - FROM
- OLYMPUS OPTICAL CO., LTD.
4090921 - AUTOMATIC CULTIVATING APPARATUS
4154652 - METHOD FOR AUTOMATICALLY AND SUCCESSIVELY CULTIVATING TISSUES OR CELLS OF A BODY
4198483 - PIPETTE EXCHANGE APPARATUS
4208484 - APPARATUS FOR HANDLING CENTRIFUGE TUBES IN AUTOMATIC CULTURE SYSTEM
- PARKE DAVIS + COMPANY
3485982 - APPARATUS FOR HARVESTING LIQUID VIRAL PRODUCTS FROM EGGS
- PIKTOR LIMITED
4001080 - PRODUCTION OF IMMUNOLOGICAL MATERIALS
- PRESIDENT AND FELLOWS OF HARVARD COLLEGE
4217412 - PRODUCTION OF TUMOR ANGIOGENESIS FACTOR BY CELL CULTURE
- REGENTS OF UNIVERSITY OF MINNESOTA
4288546 - PROCESS FOR THE LARGE SCALE PRODUCTION OF PITUITARY HORMONES BY SERIAL SECONDARY SUSPENSION CULTURE
- RESEARCH CORPORATION
3515202 - CULTURE OF ANAPLASMA MARGINALE
3843324 - METHOD OF CELL FRACTIONATION AND APPARATUS THEREFOR
- RHONE-POULENC S.A.
3927981 - MEMBRANE-TYPE BLOOD OXYGENATOR WITH RECYCLE OF OXYGEN-CONTAINING GAS
- RICHARDSON-MERRELL INC.
3900598 - METHOD OF MEASURING HISTAMINE RELEASE FROM MAST CELLS
- RUSH-PRESBYTERIAN-ST. LUKE'S MEDICAL CENTER
4042457 - PREPARATION OF TISSUE INVASION INHIBITOR AND METHOD OF TREATMENT UTILIZING THE INHIBITOR
- SANFAR LABORATORIES, INC.
3862002 - PRODUCTION OF PHYSIOLOGICALLY ACTIVE PLACENTAL SUBSTANCES
- SLOAN-KETTERING INSTITUTE FOR CANCER RESEARCH
4254226 - PROCESS FOR GROWING HUMAN EPIDERMAL CELLS IN TISSUE CULTURE
4299819 - PROCESS FOR TREATING BURN VICTIMS
- SMITHKLINE CORPORATION
3740321 - CELL PROPAGATOR
- SOCIETA FARMACEUTICI ITALIA S.P.A.
3732149 - APPARATUS FOR THE LARGE SCALE GROWTH OF LIVING CELLS

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

STRATEGIC MEDICAL RESEARCH CORPORATION
4017808 - THERAPEUTIC COMPOSITION AND METHOD OF THERAPEUTICALLY TREATING WARM BLOODED ANIMALS THEREWITH

SYNTEX (U.S.A.) INC.

4070453 - DIPLOID PORCINE EMBRYONIC CELL STRAINS, CULTURES PRODUCED THEREFROM, AND USE OF SAID CULTURES FOR PRODUCTION OF VACCINES

TORAY INDUSTRIES INC.

4228243 - CELL CULTURE PROPAGATION APPARATUS

UNITED STATES OF AMERICA, AGRICULTURE

4049494 - VACCINE PRODUCTION PROCESS

UNITED STATES OF AMERICA, ARMY

3445340 - ROTOR CHAMBER INSERT

UNITED STATES OF AMERICA HEALTH EDUCATION AND WELFARE, MESNE

3628287 - PRODUCTION OF OTIOGENIN BY PLANT TISSUE CULTURE TECHNIQUE

3726597 - CONTROLLED ENVIRONMENT CULTURE SYSTEM FOR LIGHT MICROSCOPY

3821087 - CELL CULTURE ON SEMI-PERMEABLE TUBULAR MEMBRANES

3883393 - CELL CULTURE ON SEMI-PERMEABLE TUBULAR MEMBRANES

4148888 - 3-OEAZAADENOSINE AS AN INHIBITOR OF ADENOSYLMONOCYSTEINE HYDROLASE WITH ANTIVIRAL ACTIVITY

4247646 - LABORATORY APPARATUS FOR CLONING MAMMALIAN CELLS

UNITED STATES OF AMERICA, NAVY

3851246 - METHOD OF PREDICTING THE POST TRANSFUSION VIABILITY OF PRESERVED ERYTHROCYTES AND OTHER SIMILAR CELLS

4018911 - METHOD FOR LARGE VOLUME FREEZING AND THAWING OF PACKED ERYTHROCYTES

UNITED STATES OF AMERICA

4080905 - SUB-PRIMATE DIPLOID CELL LINES AS SUBSTRATES FOR VIRUS VACCINE PRODUCTION

4080902 - OVAL CIRCUIT, MOVING ARTIFICIAL CAPILLARY BUNDLE FOR CELL CULTURE

4220725 - CAPILLARY CELL CULTURE DEVICE

4241187 - METHOD AND APPARATUS FOR CELL AND TISSUE CULTURE

4296206 - IRREVERSIBLE ANTI-GLUCOCORTICOIDS

UNIVERSITY OF CALIFORNIA, THE REGENTS OF

3520081 - METHOD FOR GROWING ALGAE

UNIVERSITY OF ILLINOIS FOUNDATION

3934369 - VITRO NET BIOXSYNTHESIS OF CHLOROPHYLL AND GRANA

UNIVERSITY OF KENTUCKY RESEARCH FOUNDATION

4083998 - INACTIVATED EQUINE RHINOPNEUMONITIS VIRUS VACCINE AND USE THEREOF

UNIVERSITY OF MINNESOTA, THE REGENTS OF

3846937 - PRODUCTION OF ALLERGENS BY PLANT TISSUE CULTURE TECHNIQUE

4082613 - PROCESS FOR THE PRODUCTION OF INSULIN BY GENETICALLY TRANSFORMED FUNGAL CELLS

4124448 - PROCESS FOR THE LARGE SCALE PRODUCTION OF HUMAN GROWTH HORMONE BY SERIAL SECONDARY SUSPENSION CULTURE

UNIVERSITY OF TOLEDO

4208483 - TISSUE CULTURE SYSTEM

UPJOHN COMPANY

4014993 - INHIBITION OF PLATELET AGGREGATION WITH SUBSTITUTED PHENYLHYDROXYTROPIC ACID COMPOUNDS

4092425 - RESTORATION OF INTERFERON RESPONSE

TISSUE CULTURE

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

VIRTIS COMPANY, INC.
3649465 - SPINNER FLASK
4212950 - FERMENTING APPARATUS

WISCONSIN ALUMNI RESEARCH FOUNDATION
4124701 - METHOD FOR PREPARING A REAGENT FOR PLT AND METHOD OF USE

WISTAR INSTITUTE
4108983 - VIRAL ONCOLYSATE VACCINE FOR STIMULATING THE IMMUNE MECHANISM OF MAMMALS TO SPECIES-SPECIFIC TUMORS
4172124 - METHOD OF PRODUCING TUMOR ANTIBODIES
4196265 - METHOD OF PRODUCING ANTIBODIES

WYO BEN PRODUCTS, INC.
3935067 - INORGANIC SUPPORT FOR CULTURE MEDIA

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INVENTORS OF INDIVIDUALLY OWNED PATENTS (1/75-12/81)		(ALPHA LISTING)		PAGE D	
INVENTOR NAME	STREET	CITY	ST	ZIP/CNTRY	
MOLDENHAUER - JEANNE	RT. 2, BOX 361A	LONG GROVE	IL	60047	
4282326 - CELL CULTURE MEDIUM SUPPLEMENT					
MULLER - HANS	IM ALLMENDLI	ERLENBACH, ZURICH		CH	
3925165 - APPARATUS FOR CULTURING DF TISSUE CELLS AND MICRO-ORGANISMS	165 SHENANDOAH RD.	WARWICK	RI	02886	
PANDL - GEORG					
4242459 - CELL CULTURE DEVICE					
4242460 - CELL CULTURE DEVICE					
PAPAS - GARY R.	53 E. ROGUES RD.	HUNTINGTON	NY	11743	
4195131 - ENVIRONMENTALLY CONTROLLED UNIT					
PETERS - J.	HINRICH				
4299920 - BIOLOGICAL RECEPTACLE	LUGHAUSER STR. 70	5064 ROSRATH-HOFFNUN	DE		
RICHARDSON - PETER					
4242459 - CELL CULTURE DEVICE	60 SARGENT AVE.	PROVIDENCE	RI	02906	
4242460 - CELL CULTURE DEVICE					
ROTH - JONATHAN N.	19676 RIVERVIEW DR.	GDSHEN	IN	46526	
4282317 - PECTIN CULTURE MEDIA AND METHOD					
SANDERS - MURRAY J.	3009 SPANISH TRAIL RD.	DELRAY BEACH	FL	33444	
4162303 - POTENCY AND ATOXICITY TEST FOR MODIFIED NEURODIXIN					
SMITH - KENDALL D.	133 TRILLIUM LANE	SAN ANTONIO	TX	78213	
3943993 - LOW TEMPERATURE STORAGE DF SURFACE ATTACHED LIVING CELL CULTURES					
SUZUKI - JIRO		KAMAKURA	JA		
4060457 - APPARATUS FOR GROWING ANIMAL CELLS					
VERMA - DHARMVIR S.	5831 RUTHERGLEN	HOUSTON	TX	77096	
4296205 - CELL CULTURE AND CONTINUOUS DIALYSIS FLASK AND METHOD					

PATENTS (1/63-12/81) WITH NEITHER ASSIGNMENT NOR INVENTOR INFORMATION IN THE DATA BASE

3519710 - DIRECT ACTIVE MODIFIED LIVE VIRUS VACCINE IMMUNIZATION AGAINST TRANSMISSIBLE GASTROENTERITIS IN SWINE PIGLETS AT BIRTH					
3591460 - APPARATUS AND MEANS FOR HANDLING CELLS					
3717551 - METHOD DF CELL CULTURE					
3734851 - METHOD AND DEVICE FOR PURIFYING BLOOD					
3768977 - INTEGRAL BLOOD OXYGENATOR AND HEAT EXCHANGER					
3769174 - MICROTISSUE RESPIROMETER					
3773924 - INTERFERON PRODUCTION					
3778253 - REMOVING A CELL CULTURE FROM A CARRIER					
3812016 - CULTURE-GROWING APPARATUS					
3854470 - REPRODUCTION PROCESSES FOR CELLULAR BODIES					
3856475 - APPARATUS FOR TRANSFERRING A GAS BETWEEN TWO LIQUIDS					
3928298 - APPARATUS FOR TRANSFERRING A GAS BETWEEN TWO LIQUIDS					
4022593 - APPARATUS FOR TRANSFERRING A GAS BETWEEN TWO LIQUIDS					
4022596 - APPARATUS FOR TRANSFERRING A GAS BETWEEN TWO LIQUIDS					
4022597 - APPARATUS FOR TRANSFERRING A GAS BETWEEN TWO LIQUIDS					
3128228 - 3128231 - 3128902 - 3143470 - 3145143	3282702	397480	3073746	3105011	3122476
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TISSUE CULTURE

FRONT PAGES OF SELECTED PATENTS

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PATENTS ARE LISTED IN ORDER OF APPEARANCE

- [54] MULTIPLE INTERIOR SURFACE ROLLER
BOTTLE
- [75] Inventors: Luther R. Johnson, Thousand Oaks;
John V. Shapiro, Ontario, both of
Calif.
- [73] Assignee: Becton, Dickinson and Company,
Paramus, N.J.
- [21] Appl. No.: 176,936
- [22] Filed: Aug. 11, 1980
- [51] Int. Cl.: C12M 3/04
- [52] U.S. Cl.: 435/285; 435/240
- [58] Field of Search: 435/284, 285, 286, 340,
435/241

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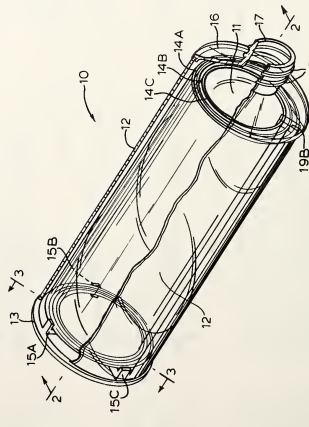
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- Primary Examiner—Robert J. Warden
Attorney, Agent, or Firm—Howard J. Rodrick

ABSTRACT

A roller bottle for cell growth culturing comprises an annular member and a housing. The annular member has at least one annular member inside the chamber spaced a short radial distance inwardly from the housing. The space between the annular member and the housing is in fluid communication with the chamber. The surface of the annular member is adapted to grow cells. The surface of the housing is adapted to grow cells thereon.

12 Claims, 5 Drawing Figures



- [54] TISSUE CULTURE DEVICE
- [76] Inventors: Fraser L. Baker, 027 Orange St.,
Los Angeles, Calif. 90008; John H.
Baker, 10000 Wilshire Blvd., Suite 100,
Beverly Hills, Calif. 90210; and
Kingston, Ontario, Canada, K7M
4M5
- [21] Appl. No.: 137,275
- [22] Filed: Apr. 4, 1980
- [51] Int. Cl.: C12M 1/26; C12M 3/00
- [52] U.S. Cl.: 435/299; 435/301; 435/298;
435/297
- [58] Field of Search: 435/298, 299, 300, 301

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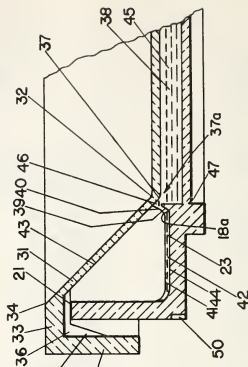
Primary Examiner—Robert J. Warden

ABSTRACT

A disposable tissue culture device, particularly for aerobic cultures, comprising a tissue culture dish containing at least one shallow culture chamber for the growth of

microorganisms, and a cover for the culture dish to prevent the entrance of contaminants, the cover being adapted to be placed over the culture dish and to hold the culture chamber in place. The cover is adapted to provide optimal viewing of each culture chamber by light microscopy through a transparent cover window, standoffs being provided to hold the cover above the culture chamber to assure atmospheric communication between each culture chamber and ambient atmosphere; minimum annular space being provided between the cover and upper edge of each culture chamber to maintain an almost constant annular fluid reservoir around the culture chamber to hold the culture stable during culturing, handling and vibration, yet permit the culture to breathe. The transparent cover window portion of the cover enclosing the culture chamber is adapted to be removed from the cover and has a slight convex, upward curve on the inside surface adjacent to the edge to permit egress of bubbles due to de-gassing of fluid in each culture chamber. An annular fluid reservoir, provided around the upper edge of each culture chamber, is adapted to maintain a constant level of fluid around the culture chamber to prevent evaporation of fluid from the culture and provides a tolerance on the filling volume. Lift lugs are provided on opposite sides of the dish extending outward beyond the cover and upward from the culture chamber to hold the cover above the culture chamber. The cover located between the lift lugs extending only partway around the dish to permit easy removal and replacement of the cover for administration of specimen and other ingredients to each culture chamber.

10 Claims, 6 Drawing Figures



[54] ARRANGEMENT FOR CULTIVATING CELLS OF ANIMAL AND HUMAN TISSUES

- [75] Inventors: Henry Girard, Buragony/Vd; Rudolf Schürmann, both of Switzerland
- [73] Assignee: Cnomp AG, Mannedorf, Switzerland

[*] Notice: The portion of the term of this patent subsequent to Oct. 14, 1997, has been declined.

[21] Appl. No.: 130,261

[22] Filed: Mar. 13, 1990

Related U.S. Application Data

[63] Continuation of Ser. No. 094,015, Aug. 16, 1978, Pat. No. 4,252,564.

Foreign Application Priority Data

Aug. 16, 1977 [CH] Switzerland 1059/77

[51] Int. Cl. C12M 3/00

[52] U.S. Cl. 435/284; 435/285; 435/310; 435/412; 435/413

[58] Field of Search 435/284; 310; 435/285; 435/312

14 Claims, 6 Drawing Figures

[54] U.S. PATENT DOCUMENTS

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Primary Examiner—B. B. Reichard

Attorney, Agent, or Firm—Michael J. Striker

[57] ABSTRACT

An arrangement for culturing cells of animal and human tissues in a monocellular layer and the like, has a container bounding an inner chamber for accommodating a nutrient medium, and a plurality of tubular supporting members extending from the outer wall of the container about an axis. The tubular rotatable elements extend in an axial direction of the inner chamber of the container. Additional elements are provided for rotating the tubular supporting members. The tubular supporting members include a axle which defines the axis of rotation, and two end discs arranged adjacent to and supporting one end of the axial ends of the tubular supporting members. The tubular supporting members are arranged in a horizontal direction. However, they can be inclined at an angle relative to the horizontal direction by means of a rotation of the end discs in mutually opposite directions.

14 Claims, 6 Drawing Figures

[54] METHOD OF AND AN ARRANGEMENT FOR CULTIVATING CELLS OF ANIMAL AND HUMAN TISSUES

- [75] Inventors: Hermann Kattinger, Vienna; Wilfried Schürmann, Wien-Neudorf, both of Austria
- [73] Assignee: Cnomp AG, Mannedorf, Switzerland

[*] Notice: The portion of the term of this patent subsequent to Nov. 6, 1996, has been declined.

[21] Appl. No.: 15,282

[22] Filed: Feb. 26, 1979

Related U.S. Application Data

[63] Continuation of Ser. No. 446,165, Oct. 6, 1977, Pat. No. 4,173,516, which is a division of Ser. No. 814,415, Jan. 11, 1977, abandoned.

Foreign Application Priority Data

Jul. 15, 1976 [AT] Austria 521/76

[51] Int. Cl. C12M 3/02

[52] U.S. Cl. 435/286; 435/287; 435/288; 435/289; 435/290; 435/291; 435/292; 435/293; 435/294; 435/295; 435/296; 435/297; 435/298; 435/299; 435/300; 435/301; 435/302; 435/303; 435/304; 435/305; 435/306; 435/307; 435/308; 435/309; 435/310; 435/311; 435/312; 435/313; 435/314; 435/315; 435/316; 435/317; 435/318; 435/319; 435/320; 435/321; 435/322; 435/323; 435/324; 435/325; 435/326; 435/327; 435/328; 435/329; 435/330; 435/331; 435/332; 435/333; 435/334; 435/335; 435/336; 435/337; 435/338; 435/339; 435/340; 435/341; 435/342; 435/343; 435/344; 435/345; 435/346; 435/347; 435/348; 435/349; 435/350; 435/351; 435/352; 435/353; 435/354; 435/355; 435/356; 435/357; 435/358; 435/359; 435/360; 435/361; 435/362; 435/363; 435/364; 435/365; 435/366; 435/367; 435/368; 435/369; 435/370; 435/371; 435/372; 435/373; 435/374; 435/375; 435/376; 435/377; 435/378; 435/379; 435/380; 435/381; 435/382; 435/383; 435/384; 435/385; 435/386; 435/387; 435/388; 435/389; 435/390; 435/391; 435/392; 435/393; 435/394; 435/395; 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436/404; 436/405; 436/406; 436/407; 436/408; 436/409; 436/410; 436/411; 436/412; 436/41

Berkly et al.

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[45]

Jan. 27, 1981

[54] LABORATORY APPARATUS FOR CLONING MAMMALIAN CELLS

[75] Inventors: John J. Berkly, Little Rock, John Hunter, Jr., Pine Bluff, Laurence A. Zolotor, Little Rock, all of A.R.

[73] Assignee: The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

[21] Appl. No.: 941,666

[22] Filed: Sep. 12, 1978

[31] Int. Cl.: C12N 3/00; C12M 1/00

[32] U.S. Cl.: 435,284; 30/301; 30/358; 435/287

[56] Field of Search: 435/284, 285, 286, 287, 435/292, 297, 298, 299, 30/301, 358

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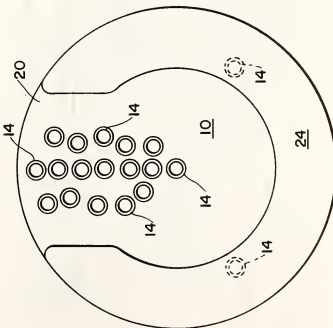
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Primary Examiner—Robert J. Warden
Attorney, Agent, or Firm—John S. Roberts, Jr.

[57] ABSTRACT

Laboratory apparatus for cloning mammalian cells includes a support plate with a plurality of cylindrical members disposed on one face thereof. All of the cylinders, with the exception of one pair, are disposed within a concentric array defined within a predetermined sector region of the plate from the sector array yet equidistantly spaced from each other and from the sector array so as to complete the distribution pattern. A substantially C-shaped ring member is fixedly secured to, or introduced into, the support plate in order to facilitate maneuverability of the assembly when placing the same onto a Petri dish for isolating the colonies developing thereon. The plate and ring member are fabricated from material to be identified or viewed by background lighting techniques. The distal ends of the isolating cylinders are also sharply beveled in order to cut into or penetrate the Petri dish so as to sealingly isolate the colonies.

13 Claims, 13 Drawing Figures



[54] METHOD OF CULTIVATING CELLS OF ANIMAL AND HUMAN TISSUES

[75] Inventors: Hermann Katagier, Vienna, Wilfried Sauer, Wiener-Neudorf, both of Austria

[73] Assignee: Ciba AG, Mannheim, Switzerland

[21] Appl. No.: 936,600

[22] Filed: Aug. 23, 1978

[31] Int. Cl.: C12N 5/02

[32] U.S. Cl.: 435/241; 261/77

[56] Field of Search: 435/311, 316, 261/77

[36] Reference Cited

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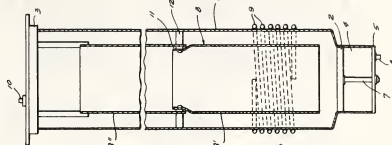
Primary Examiner—Robert J. Warden

Attorney, Agent, or Firm—Michael J. Striker

[57] ABSTRACT

A method of cultivating cells of animal and human tissues includes the steps of introducing the cells into a solution in a container, suspending the cells in the solution in a suspended state so as to prevent their settling by introducing an oxygen-containing gas into the solution. An apparatus for carrying out the method is provided for introducing the oxygen-containing gas into the container, and a guide arrangement in the container and operative for guiding the nutrient solution so that the latter performs a circular movement in the container. The nutrient solution is introduced into the latter. The guide arrangement may be formed as a tubular member, as a substantially flat partition wall, or as an inner wall of a circumferentially complete tubular container.

8 Claims, 6 Drawing Figures



[54] METHOD AND APPARATUS FOR CELL AND TISSUE CULTURE

[75] Inventor: David C. White, Maple Grove, Minn.
 [79] Assignee: United States of America, Washington, D.C.

[21] Appl. No.: 24,247

[22] Filed: Mar. 27, 1979

[51] Int. Cl.¹ C12M 3/00
 [52] U.S. Cl. 435/285; 210/231.2; 210/231.3

[58] Field of Search 435/240, 341; 210/231 A, 321 B, DIG. 3, 128/DIG. 3

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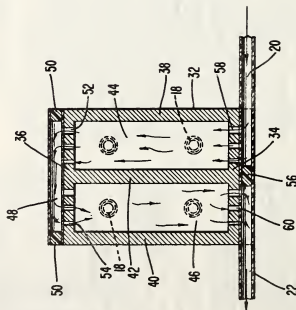
Primary Examiner—B. Penland

Attorney, Agent, or Firm—Holman & Stern

[57] ABSTRACT

A method and apparatus for culturing biological cells and tissues in high density are disclosed, employing perfused blood as the nutrient source. The cells or tissues are separated from the perfused blood by means of a porous membrane which is permeable to nutrients but not contact with the cells or tissues, and which is impermeable to plasma solutes and to cell products and impermeable to blood cellular components, whereby continuous diffusion of nutrients occurs between the cells or tissues through the micro-porous membrane while maintaining the cells or tissues separated from the cellular components of the blood. The blood flow passageway across the porous membrane is controlled by a valve mechanism enabling blood perfusion at a sufficiently high linear velocity so as to avoid thrombus. Continuous blood perfusion through the blood flow passageway is provided by connecting the blood flow passageway into an arterio-venous shunt constructed in a living donor animal.

2 Claims, 3 Drawing Figures



18 Claims, 7 Drawing Figures

[54] CELL CULTURE DEVICE

[75] Inventors: William L. Click, 32 Willow Rd., Wellesley, Mass. 02181; Pierre M. Galletti, 36 Tabor Ave., West of Richardson, R. Sargent Ave., both of 165 Sherwood Rd., Warwick, R.I. 02886

[21] Appl. No.: 972,961

[22] Filed: Dec. 26, 1978

[51] Int. Cl.¹ C12M 3/00
 [52] U.S. Cl. 435/284; 3/1; 128/DIG. 3; 210/231.2; 210/231.3

[58] Field of Search 435/240, 341, 1, 2, 210/231, 321 A, 497; 128/DIG. 3, 3/1

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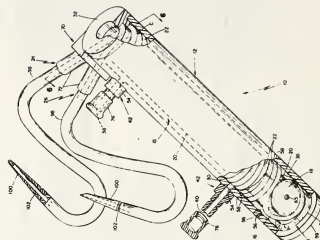
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Primary Examiner—Robert J. Warden

ABSTRACT

A cell culture device for use, e.g., as an artificial pancreas, featuring, in various aspects, a semipermable tube, having a porous membrane, which is permeable to form a cell culture compartment; an inlet and an outlet strand of the semipermable tube being wrapped to form alternating adjacent coils to provide improved blood flow; and a conductive tube being wrapped to form helical coils to provide improved conductive transport.

18 Claims, 7 Drawing Figures



[54] ARRANGEMENT FOR CULTIVATING
CELLS OF ANIMAL AND HUMAN TISSUES

[75] Inventors: Henry Grand, Burigny; Rudolf
Bühler, Wolfhausen, both of
Switzerland

[73] Assignee: Chemap AG, Mannedorf,
Switzerland

[21] Appl. No.: 934,315

[22] Filed: Aug. 16, 1978

[30] Foreign Application Priority Data
Aug. 16, 1977 (CH) Switzerland

[51] Int. Cl.³ C12M 3/00

[52] U.S. Cl. 435/284, 435/310, 435/284, 313, 310

[58] Field of Search 105/127, 435/313, 435/284, 313, 310

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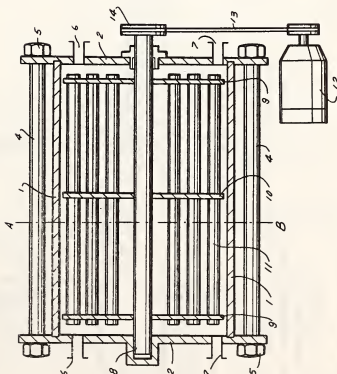
Primary Examiner: R. B. Penland

Attorney, Agent, or Firm: Michael J. Strider

[57] ABSTRACT

An arrangement for cultivating cells of animal and human tissues in a container, comprising a container housing an inner chamber for accommodating a nutrient medium, and a plurality of tubular supporting elements for supporting the cells and rotatable about an axis. The tubular rotatable elements extend in parallel with one another. The tubular supporting elements are provided for rotating the tubular supporting elements. These additional rotating elements include an axle which defines the axis of rotation, and a drive mechanism for rotating the tubular supporting elements. The tubular supporting elements extend in a horizontal direction. However, they can be inclined at an angle relative to the horizontal direction by means of rotation of the end discs in mutually opposite directions.

11 Claims, 6 Drawing Figures



[54] ROLLER BOTTLE

[75] Inventor: Robert W. Lynn, Onondaga, Calif.
[73] Assignee: Becton, Dickinson and Company,
Rutherford, N.J.

[21] Appl. No.: 849,450

[22] Filed: Oct. 10, 1978

[51] Int. Cl.³ C12M 1/24

[52] U.S. Cl. 435/284, 286, 296; D9/90, 92, 103, 125

[58] Field of Search 215/1 R, 1 C, 329, 10, 435/284, 286, 296; D9/90, 92, 103, 125

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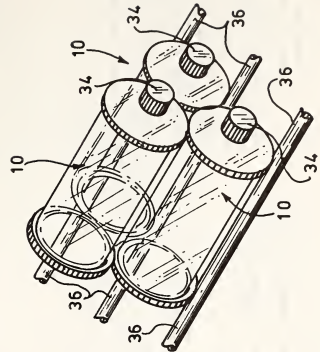
184197 4/1906 Fed. Rep. of Germany 215/1 R
184197 4/1906 Fed. Rep. of Germany 215/1 R
530076 10/1955 Italy 215/1 R

Primary Examiner—Donald F. Norton
Attorney, Agent, or Firm—Kane, Dahlmer, Kane,
Sullivan and Kircus

[57] ABSTRACT

A roller bottle is disclosed having a plurality of sections which may be bonded after their interior surfaces have been treated to enhance cell adhesion. The bottle may be used as a primary cell culture vessel, and a pair of serially connected bottles may be used for the serial passage of cells. The bottle includes a cylindrical section, a top cap having a threaded neck, and a screw cap. The bottle also includes a plurality of serrated edges which enable the bottle to be used as a roller bottle apparatus. A method for the use of the bottles is also disclosed wherein a roller apparatus is able to rotate a large number of stacked bottles.

14 Claims, 3 Drawing Figures



Tissue Culture System

[75] Inventor: Harold H. Lee, Toledo, Ohio
 [73] Assignee: The University of Toledo, Toledo, Ohio

[21] Appl. No.: 944,267

[22] Filed: Sep. 21, 1978

[23] Int. Cl. G12M 5/00

[24] U.S. Cl. 435/284, 435/213

[25] Field of Search 155/127, 139, 142;

435/284, 313

References Cited

3,023,314 4/1962 Meani et al. 195/127 X
 3,062,724 11/1962 Reaser et al. 195/127 X
 3,600,453 11/1972 Hume et al. 195/127
 4,000,981 1/1977 Hume et al. 195/127
 4,065,359 12/1977 Hume et al. 195/127

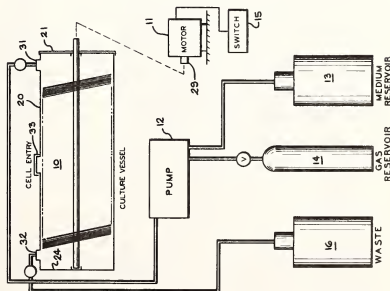
Primary Examiner—R. B. Penland

Attorney, Agent, or Firm—Wilson, Frazer, Barker & Clements

ABSTRACT

A tissue culture system for zero gravity high-density cultivation of eucaryotic cells requiring attachment to a major component of the system is a cylindrical bottle filled with culture medium and having mounted therein a rotatable shaft. The shaft includes a plurality of collars, each collar projecting therefrom and at an angle to the shaft to impel the culture medium as the shaft is rotated. Means are provided for initial stocking of the bottle with the culture cells and for continuously supplying culture medium to and removing waste medium from the bottle.

4 Claims, 2 Drawing Figures



CELL AND VIRUS CULTURE SYSTEMS

[75] Inventors: Ronald C. Telling, Woking, Roy J. Telling, Philip B. Telling, all of England
 [73] Assignee: Kitchenier David G. Hopkinson, both of Farnborough, all of England

[73] Assignee: Burroughs Wellcome Co., Research Triangle Park, N.C.

[21] Appl. No.: 793,660

[22] Filed: Apr. 1, 1977

[23] Int. Cl. C12K 9/00, C12N 5/00

[24] U.S. Cl. 435/284

[25] Field of Search 195/1.8, 1.7

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 670,448, Mar. 25, 1976, Pat. No. 4,063,303, and Ser. No. 354,195, Apr. 25, 1975, abandoned.

Foreign Application Priority Data

[30] Apr. 26, 1977 (GB) United Kingdom 1937/72

[31] Int. Cl. C12K 9/00, C12N 5/00

[32] U.S. Cl. 435/284

[33] Field of Search 195/1.8, 1.7

References Cited

U.S. PATENT DOCUMENTS
 3,493,651 2/1970 Shaw 195/1.1
 3,717,551 2/1973 Buzan et al. 195/1.1
 4,055,666 10/1977 Torrey et al. 195/1.1

FOREIGN PATENT DOCUMENTS

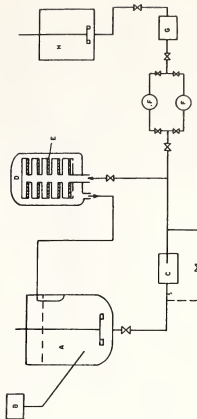
1517518 1/1970 Fed. Rep. of Germany
 1786234 1/1970 France
 893247 4/1965 United Kingdom
 Primary Examiner—Shep K. Rose

Attorney, Agent, or Firm—Donald Brown

ABSTRACT

A cell culture system which comprises living eucaryotic cells, such as those of human or animal origin, or mycoplasma dispersed within a solid carrier body or bed, the carrier body or bed being capable of retaining the cells while allowing liquid media to pass through or to have contact with the said cells, and processes for preparing and maintaining such cell systems, particularly for the purpose of virus propagation.

21 Claims, 1 Drawing Figure



[54] CONTINUOUS CELL CULTURE SYSTEM

[75] Inventors: William R. Tolbert, Manchester; Joseph Feder, University City; Richard C. Kinna, Creve Coeur, all of Mo.

[73] Assignee: Monsanto Company, St. Louis, Mo.

[21] Appl. No.: 918,898

[22] Filed: Jun. 26, 1978

Related U.S. Application Data

[62] Division of Ser. No. 830,987, Nov. 14, 1977.

[51] Int. Cl.: C12K 9/00

[52] U.S. Cl.: 435/241; 435/286

[58] Field of Search: 435/241; 195/118

References Cited

U.S. PATENT DOCUMENTS
2,829,931 4/1958 DePre et al. 395/451
3,039,932 6/1962 McLinn et al. 195/118
3,241,675 3/1966 Pashian et al. 210/73
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3,890,748 1/1974 Cook et al. 195/118
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4,095,445 11/1977 Tolbert et al. 195/118

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Thayer et al., Cancer Research vol. 30 (Jun. 1970) pp. 555-557.
Cook et al., In Vitro vol. 9 No. 5 (1974) pp. 318-322.
Lynn et al., Biotech. Bioeng. vol. XVII (1975) pp. 659-673.

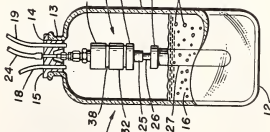
Primary Examiner—Sam Rosen

Attorney, Agent, or Firm—Scott J. Meyer; James W. Williams, Jr.

ABSTRACT

A cell culture system and apparatus is provided for the continuous culture of mammalian cells in which fresh media can be added and spent medium filtered and withdrawn on a continuous or semi-continuous basis without cell disruption. The apparatus comprises a horizontal cylindrical vessel with a central shaft, a filter unit, and a filter unit suspended downwardly therefrom, said filter unit being in fluid communication with the top of the vessel. The filter unit is adapted to rotate about its shaft means and adapted for coaxial rotation with said shaft means.

1 Claim, 5 Drawing Figures



[54] DUAL CIRCUIT, WOVEN ARTIFICIAL CAPILLARY BUNDLE FOR CELL CULTURE

[75] Inventors: Richard A. Knezek; Pietro M. Gallini, both of Bethesda, Md.; David S. Frankel, Newark, Del.

[73] Assignee: The Government of the United States, Washington, D.C.

[21] Appl. No.: 850,810

[22] Filed: Nov. 11, 1977

[51] Int. Cl.: C12K 1/18; C12K 9/00

[52] U.S. Cl.: 435/284; 435/241; 435/242

[58] Field of Search: 435/241; 195/127

References Cited

U.S. PATENT DOCUMENTS
3,732,149 5/1973 Sauer 195/127 X
3,903,321 6/1973 Pagano et al. 195/127
3,813,087 6/1974 Knezek et al. 195/127
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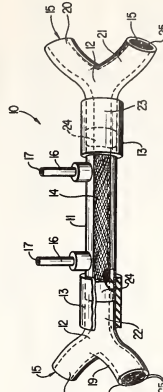
Michael Ruz, Mass Transfer by Connection and Diffusion in an Artificial Capillary System; Graduate Thesis, Jan. 1976.

Primary Examiner—Raymond N. Jones
Assistant Examiner—Robert J. Warden
Attorney, Agent, or Firm—Holman & Stern

ABSTRACT

An artificial capillary cell culture device having two separate perfusion circuits and with the stratification of cells in the capillary bundle. The present device provides a matrix for high density growth of cultured cells in a continuous perfusion system. The device is particularly well adapted for the use of pressure differences between perfusion circuits, such as in the simulation of lymphatic drainage.

2 Claims, 4 Drawing Figures



[54] CELL CULTURE PROPAGATION APPARATUS

[75] Inventor: Masakiko Iizuka, Fujiwara, Japan

[73] Assignee: Terry Industries, Inc., Tokyo, Japan

[21] Appl. No. 894,221

[22] Filed: Jan. 13, 1978

[57] References Cited

U.S. PATENT DOCUMENTS

3,575,813 4/1971 Rohmeyer

3,576,721 4/1971 Mason

3,928,142 12/1975 Smith

Primary Examiner—Alvin E. Tuerholtz

Attorney, Agent, or Firm—Miller & Peltis

ABSTRACT

Apparatus and method for propagating tissue culture

cells and for assembling the cells into a tissue

assembly. The cells are grown between the plates.

Gases or liquid media may be introduced between the

plates.

1 Claim, 10 Drawing Figures

[57] References Cited

U.S. PATENT DOCUMENTS

3,575,813 4/1971 Rohmeyer

3,576,721 4/1971 Mason

3,928,142 12/1975 Smith

Primary Examiner—Alvin E. Tuerholtz

Attorney, Agent, or Firm—Miller & Peltis

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Gases or liquid media may be introduced between the

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1 Claim, 10 Drawing Figures

[57] References Cited

U.S. PATENT DOCUMENTS

3,575,813 4/1971 Rohmeyer

3,576,721 4/1971 Mason

3,928,142 12/1975 Smith

Primary Examiner—Alvin E. Tuerholtz

Attorney, Agent, or Firm—Miller & Peltis

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1 Claim, 10 Drawing Figures

[57] References Cited

U.S. PATENT DOCUMENTS

3,575,813 4/1971 Rohmeyer

3,576,721 4/1971 Mason

3,928,142 12/1975 Smith

Primary Examiner—Alvin E. Tuerholtz

Attorney, Agent, or Firm—Miller & Peltis

ABSTRACT

Apparatus and method for propagating tissue culture

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assembly. The cells are grown between the plates.

Gases or liquid media may be introduced between the

plates.

1 Claim, 10 Drawing Figures

[57] References Cited

U.S. PATENT DOCUMENTS

3,575,813 4/1971 Rohmeyer

3,576,721 4/1971 Mason

3,928,142 12/1975 Smith

Primary Examiner—Alvin E. Tuerholtz

Attorney, Agent, or Firm—Miller & Peltis

[54] PIPETTE EXCHANGE APPARATUS

[75] Inventors: Shirohiko Sogi, Makoto Yoshinaga,

both of Iizuka, Japan

Chofu, Hino Tawara, Hachioji, all of

Japan

[73] Assignee: Olympus Optical Company Limited,

Tokyo, Japan

[21] Appl. No. 886,688

[22] Filed: Mar. 15, 1978

[57] References Cited

U.S. PATENT DOCUMENTS

3,175,734 3/1965 Hess

3,832,135 8/1974 Prodzowski et al.

3,843,331 10/1974 Quane

3,875,748 5/1975 Sugi

3,928,142 12/1975 Smith

Primary Examiner—Michael S. Marcus

Attorney, Agent, or Firm—Toren, McGrady and Stanger

ABSTRACT

A pipette exchange apparatus for use in a system for

automatically culturing a biosource or a cell includes a

pipette mounting device for mounting a dividing and

injecting means, a pipette supply device and a pipette

feeding device.

3 Claims, 9 Drawing Figures

[57] References Cited

U.S. PATENT DOCUMENTS

3,175,734 3/1965 Hess

3,832,135 8/1974 Prodzowski et al.

3,843,331 10/1974 Quane

3,875,748 5/1975 Sugi

3,928,142 12/1975 Smith

Primary Examiner—Michael S. Marcus

Attorney, Agent, or Firm—Toren, McGrady and Stanger

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feeding device.

3 Claims, 9 Drawing Figures

[57] References Cited

U.S. PATENT DOCUMENTS

3,175,734 3/1965 Hess

3,832,135 8/1974 Prodzowski et al.

3,843,331 10/1974 Quane

3,875,748 5/1975 Sugi

3,928,142 12/1975 Smith

Primary Examiner—Michael S. Marcus

Attorney, Agent, or Firm—Toren, McGrady and Stanger

ABSTRACT

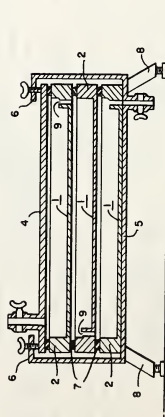
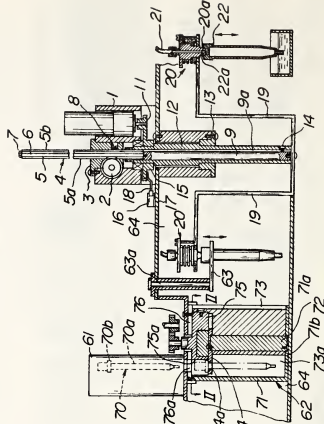
A pipette exchange apparatus for use in a system for

automatically culturing a biosource or a cell includes a

pipette mounting device for mounting a dividing and

injecting means, a pipette supply device and a pipette

feeding device.



STARCH HYDROLYSATES

This profile includes processes for synthesizing monosaccharides by the action of an enzyme or microorganism, and for preparing products by the action of exo-1.4 alpha glucosidase, isomerase, beta-amylase, alpha-1, 6-glucosidase, glycosyl transferase or carbohydrase enzymes. Examples of reactions are the enzymatic isomerization of glucose to fructose and the enzymatic hydrolysis of starch to glucose.

INCLUDED IN THIS PROFILE ARE ALL OF THE PATENTS FROM:

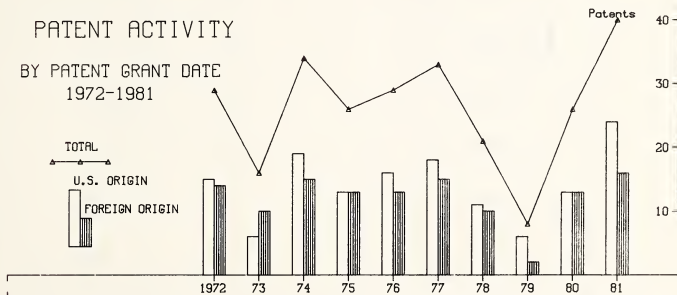
Class 435, Subclasses 94-99 and 105

ACTIVITY INDICES (1979-1981)

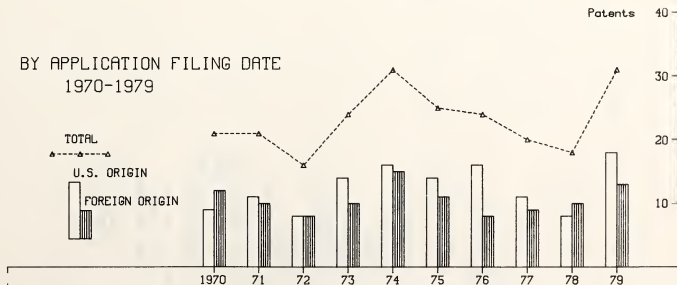
GROWTH	28.2%
FOREIGN SHARE	41.9%
CORPORATE OWNED	100.0%
GOVERNMENT OWNED	0.0%
U.S. OWNED OF FOREIGN	29.0%

PATENT ACTIVITY

BY PATENT GRANT DATE
1972-1981



BY APPLICATION FILING DATE
1970-1979



STARCH HYDROLYSATES - PART 2A

PATENT ACTIVITY (1/63-12/81) BY DATE OF PATENT GRANT

	NUMBER OF PATENTS														PAGE A	
	63-67	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	TOTAL
TOTAL	34	5	6	10	18	29	16	34	26	29	33	21	8	26	40	335
U.S. ORIGIN	27	4	4	9	13	15	6	19	13	16	18	11	6	13	24	198
FOREIGN ORIGIN	7	1	2	1	5	14	10	15	13	13	15	10	2	13	16	137
JAPAN	4	1	2	1	3	12	9	11	6	8	7	6	1	3	9	83
UNITED KINGDOM	1										3	1		2		13
WEST GERMANY	2				1	1	1	3	2	1	1	1		1	1	9
BELGIUM									1		2			4		7
FRANCE									1	2	1			1	2	7
DENMARK					1				2		1			2		6
SWEDEN						1				1		2			1	3
SWITZERLAND												1				1
AUSTRIA								1				1			1	1
NETHERLANDS													1			1
CANADA															1	1
ISRAEL															1	1
ITALY																1
EAST GERMANY																1
U.S. ORIGIN	27	4	4	9	13	15	6	19	13	16	18	11	6	13	24	198
U.S. CORP. OWNED	24	3	4	8	12	14	4	19	12	14	13	9	6	13	24	179
U.S. GOVT. OWNED					1	1				1	1	1				6
U.S. INDIV. OWNED	3			1			1		1		3	1				10
FOREIGN OWNED		1								1	1					3
FOREIGN ORIGIN	7	1	2	1	5	14	10	15	13	13	15	10	2	13	16	137
U.S. OWNED	1				1	1		1	1	2	2	1		4	5	18
FOREIGN OWNED	6	1	2	1	4	14	10	14	12	11	13	9	2	9	11	119
FOREIGN CORP.	5	1	2	1	3	13	10	13	11	11	13	7	2	9	11	112
FOREIGN GOVT.																
FOREIGN INDIV.	1				1	1		1	1		2					7

STARCH HYDROLYSATES

PATENT ACTIVITY (PATENTS GRANTED 1/67-12/81) BY DATE OF PATENT APPLICATION

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FOREIGN ORIGIN	7	4	14	12	10	8	10	15	11	8	9	10	13	2		133
JAPAN	6	3	11	10	9	6	2	9	7	2	4	2	8	2		81
UNITED KINGDOM																12
WEST GERMANY	1	1	2	1		2	2	1	2	1	1	1	1			12
NETHERLANDS																7
FRANCE																7
BELGIUM																7
ITALY																6
DENMARK																3
SWEDEN																3
SWITZERLAND																2
AUSTRALIA																1
AUSTRIA																1
NETHERLANDS																1
CANADA																1
ISRAEL																1
ITALY																1
EAST GERMANY																1
U.S. ORIGIN	31	12	10	9	11	8	14	16	14	16	11	8	18	4		182
U.S. CORP. OWNED	28	11	10	8	9	7	14	14	10	13	11	8	18	4		165
U.S. GOVT. OWNED																6
U.S. INDIV. OWNED	2	1		1	1	1	1	1	2	1						8
FOREIGN OWNED	1															3
FOREIGN ORIGIN	7	4	14	12	10	8	10	15	11	8	9	10	13	2		133
U.S. CORP. OWNED	1															1
FOREIGN OWNED	6	4	12	12	10	8	10	13	8	7	9	8	6	2		115
FOREIGN CORP.	5	3	11	12	10	7	9	13	8	5	9	8	6	2		108
FOREIGN GOVT.																7
FOREIGN INDIV.	1	1	1			1	1			2						7

PAGE A

STARCH HYDROLYSATES

Organizational Patenting: Ranked

NO. OF
PATENTS ASSIGNEES WITH 2 OR MORE PATENTS (1969-1981)

47	CPC INTERNATIONAL INC.
23	HAYASHIBARA CO.
21	STANDARD BRANDS INC.
18	A. E. STALEY MANUFACTURING CO.
8	R. J. REYNOLDS TOBACCO CO.
7	AGENCE NATIONALE DE VALORISATION DE LA RECHERCHE (ANVAR)
7	ANHEUSER-BUSCH, INC.
7*	HAYASHIBARA BIOCHEMICAL LABORATORIES INC.
5	NOVO INDUSTRI A/S
5	MILES LABORATORIES INC.
4	KYOWA HAKKO KOGYO CO., LTD.
4	CORNING GLASS WORKS
4	MONSANTO CO.
4	PENICK + FORD LTD.
4*	MEIJI SEIKA KAISHA LTD.
3	GLAXO LABORATORIES LTD.
3	TANABE SEIYAKU CO. LTD.
3	TAKEDA CHEMICAL INDUSTRIES LTD.
3	CHEVRON RESEARCH CO.
3	BAXTER TRAVENOL LABS., INC.
3	IMPERIAL CHEMICAL INDUSTRIES LTD.
3	NATIONAL DISTILLERS AND CHEMICAL CORP.
3	GRAIN PROCESSING CORPORATION
3* ✓	PURDUE RESEARCH FOUNDATION
2	GREAT WESTERN SUGAR CO.
2	DENKI KAGAKU KOGYO KABUSHIKI KAISHA
2	BAYER AKTIENGESSELLSCHAFT
2	BATTELLE MEMORIAL INSTITUTE
2	RESEARCH CORPORATION
2	RIKAGAKU, KENKYUSHO
2	MITSUBISHI CHEMICAL INDUSTRIES LTD.
2	UNITED STATES OF AMERICA, DEPT. OF ENERGY
2	UNITED STATES OF AMERICA, ARMY
2	DOW CHEMICAL CO.
2	ICI AMERICAS INC.
2	ROHM & HAAS CO.
2	ROQUETTE FRERES

*Composite Total. See Appendix A.

STARCH HYDROLYSATES - PART 2C

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

- ENZYMATIC PRODUCTION OF A STARCH CONVERSION PRODUCT HAVING A HIGH MALTOSE CONTENT
- AB STADEX 3996107
- A. E. STALEY MANUFACTURING COMPANY
 - PROCESS FOR PREPARING LOW D.E. SYRUPS
 - PROCESS FOR REDUCING VISCOSITY OF STABILIZED STARCH SOLUTIONS
 - METHOD FOR ENZYMATICALLY HYDROLYZING STARCH
 - METHOD FOR OBTAINING AMYLOSE FROM COOKED STARCH SOLUTIONS
 - PROCESS FOR IMPROVED ENZYME CONVERTIBILITY OF STARCH
 - METHOD FOR PREPARING LOW D. E. STARCH HYDROLYZATES
 - STARCH CONVERSION SYRUPS
 - STARCH CONVERSION COMPOSITION OF IMPROVED ENZYME CONVERTIBILITY AND PROCESS FOR USE THEREOF
 - ENZYME HYDROLYSIS
 - NON-RETROGRADED THINNED HYDROLYZATES
 - HIGH MALTOSE SYRUPS
 - PROCESS FOR THE PREPARATION OF STARCH PASTES WITH GLUCOMALYASE
 - PROCESS FOR PRODUCING DEXTROSE
 - GLUCOSE ISOMERIZING ENZYME
 - PRODUCING PULLULANASE WITH ORGANISMS HAVING A SUPERIOR CAPACITY TO ELABORATE PULLULANASE
 - ORY ISOMERASE ACTIVATION
 - DIRECTED ENZYMOLYSIS OF STARCH
 - GLUCOSE ISOMERIZATION WITH IRON ION-THIOL ACTIVATOR ION-GLUCOSE ISOMERASE SYSTEMS
- AGENCE NATIONALE DE VALORISATION DE LA RECHERCHE (ANVAR)
 - ENZYMA METHOD FOR CONVERTING GLUCOSE IN GLUCOSE SYRUPS TO FRUCTOSE
 - ENZYMA METHOD FOR MANUFACTURE OF FRUCTOSE FROM GLUCOSE
 - ENZYMA METHOD FOR MANUFACTURE OF FRUCTOSE FROM GLUCOSE
 - ENZYMA METHOD FOR CONVERTING GLUCOSE INTO FRUCTOSE
 - PROCESS FOR THE PREPARATION OF GALACTOSE AND BEVERAGES BASED ON GALACTOSE FROM SOLUTIONS CONTAINING LACTOSE
 - METHOD FOR INCREASING YIELD OF SUCROSE
 - METHOD FOR MANUFACTURE OF MALTOSE FROM STARCH BY ENZYMES CO-PRODUCED BY A SINGLE MICROORGANISM
- AKADEMIE DER WISSENSCHAFTEN OER OOR
 - METHOD OF PRODUCING STARCH HYDROLYSIS PRODUCTS FOR USE AS A FOOD ADDITIVES
- AMALGAMATED SUGAR COMPANY
 - PROCESS FOR PRODUCING A HIGH FRUCTOSE SWEETENER, HIGH PROTEIN MEAL, AND CEREAL GERM OILS
- AMERACE CORPORATION
 - IMMOBILIZED PROTEINS
- AMERICAN CRYSTAL SUGAR COMPANY
 - PRODUCTION OF FRUCTOSE AND USEFUL BY-PRODUCTS
- AMERICAN CYANAMID COMPANY
 - ANTIBIOTIC BL580+66 +O AND METHOD OF USE
- AMSTAR CORPORATION
 - STARCH THINNING PROCESS
- ANHEUSER-BUSCH, INCORPORATED
 - METHOD OF MAKING GLUCOSE ISOMERASE AND OF CONVERTING GLUCOSE TO FRUCTOSE
 - METHOD OF MAKING GLUCOSE ISOMERASE AND USING SAME TO CONVERT GLUCOSE TO FRUCTOSE
 - MEDIA CONTAINING MOLASSES AND CORN STEEP LIQUOR FOR PRODUCING GLUCOSE ISOMERASE FROM ACTINOPLANES AND METHOD
 - METHOD OF MAKING LIPOPHILIC STARCH DERIVATIVES
 - IMMOBILIZATION OF GLUCOSE ISOMERASE

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

ANHEUSER-BUSCH, INCORPORATED (CONTINUED)
4230802 - UNREFINED GLUCOSE SYRUP AS SUBSTRATE BY GLUCOSE ISOMERIZING ENZYME IN PRODUCING FRUCTOSE FROM GLUCOSE
4242451 - METHOD OF TREATMENT OF FLOCCULATED HOMOGENTATE OF MICROBIAL CELLS CONTAINING GLUCOSE ISOMERASE

BATTELLE MEMORIAL INSTITUTE
4016044 - METHOD OF PREPARING A REVERSIBLY PRECIPITABLE IMMOBILIZED ENZYME COMPLEX AND A METHOD FOR ITS USE
4085338 - REVERSIBLY PRECIPITABLE IMMOBILIZED ENZYME COMPLEX AND A METHOD FOR ITS USE

BAXTER TRAVENOL LABORATORIES, INC.
3708397 - SYRUP CONVERSION WITH IMMOBILIZED GLUCOSE ISOMERASE
3843442 - IMMOBILIZED GLUCOSE ISOMERASE
3966543 - ENZYME-TREATED PAPER

BAYER AKTIENGESELLSCHAFT
3879546 - SACCHARASE INHIBITORS
4013510 - GLUCOSIDE-HYDROLASE ENZYME INHIBITORS

BIO RESEARCH CENTER CO., LTD.
3990545 - ENZYMATIC HYDROLYSIS OF CELLULOSE

BOHSEI ENTERPRISE, LTD.
4302475 - METHOD OF PRODUCING MILO STARCH

CETUS CORPORATION
4246347 - PROCESS FOR THE PRODUCTION OF FRUCTOSE

CHEVRON RESEARCH COMPANY
4110475 - CELLULOSE FERMENTATION PROCESS
4208590 - CELLULOSE FERMENTATION PROCESS
4268033 - CELLULOSE FERMENTATION PROCESS

CORNING GLASS WORKS
3868304 - METHOD OF MAKING FRUCTOSE WITH IMMOBILIZED GLUCOSE ISOMERASE
3935041 - METHOD OF MAKING FRUCTOSE
3965035 - ENZYME CARRIER REGENERATION
3982997 - IMMOBILIZED GLUCOSE ISOMERASE

CORN PRODUCTS COMPANY
3425910 - PRODUCTION OF CYCLODEXTRIN

CPC INTERNATIONAL INC.
3538174 - STARCH HYDROLYSATE SYRUPS AND METHOD OF PREPARATION
3549466 - PROCESS FOR MAKING HIGH MALTOSE SYRUP
3549466 - LOW D.E. STARCH CONVERSION PRODUCTS
3560343 - PREPARATION OF HIGH MALTOSE CONVERSION PRODUCTS
3565785 - PRODUCTION OF EXTRACELLULAR GLUCOSE ISOMERASE BY STREPTOMYCES
3622463 - PROCEDURE FOR PRODUCTION OF ALPHA-CYCLODEXTRIN
3640847 - PRODUCTION OF CYCLODEXTRIN FROM GRANULAR MODIFIED STARCHES
3652398 - PRODUCTION OF HIGH MALTOSE SYRUP
3654082 - METHOD OF PREPARING A DRIED GLUCOAMYLASE PREPARATION
3663372 - PROCESS FOR THE PRODUCTION OF NON-HAZING STARCH CONVERSION SYRUPS
3756919 - METHOD OF UPGRADING STARCH-CONTAINING CRUDE GLUTEN PREPARATIONS
3782364 - METHOD OF PRODUCING A STARCH-CONTAINING CRUDE GLUTEN PREPARATION
3829714 - THERMOPHILIC GLUCOSE ISOMERASE ENZYME PREPARATION
3847740 - PROCESS FOR THE PRODUCTION OF LEVULOSE-BEARING SYRUPS
3847741 - TEMPERATURE-PROGRAMMED PROCESS FOR THE PRODUCTION OF LEVULOSE-BEARING SYRUPS

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

(CONTINUED)

- CPC INTERNATIONAL INC.
 3849194 - LOW O.E. STARCH CONVERSION PRODUCTS
 3853706 - PROCESS FOR PRODUCING NON-WAXY STARCH HYDROLYSATES
 3910821 - ENZYMIC ISOMERIZATION PRODUCT
 3922196 - ENZYMIC HYDROLYSIS OF GRANULAR STARCH
 3922197 - PROCESS FOR CONVERTING GRANULAR STARCH TO DEXTROSE
 3922198 - PROCESS FOR CONVERTING GRANULAR STARCH TO DEXTROSE
 3922199 - ENZYMIC HYDROLYSIS OF GRANULAR STARCH
 3922200 - ENZYMIC HYDROLYSIS OF GRANULAR STARCH
 3922201 - PREPARATION OF LEVELOSE FROM GRANULAR STARCH
 3935070 - PRODUCTION OF SWEET SYRUP FROM DEXTROSE MOTHER LIQUOR
 3950685 - INERT, NON-POROUS GRANULES FOR FLOW CONTROL IN A PLUG FLOW REACTOR
 3960863 - PROCESS FOR THE CONTINUOUS ISOMERIZATION OF DEXTROSE
 3974032 - LOW O.E. STARCH HYDROLYSATES OF IMPROVED STABILITY
 3974033 - MALTO-DEXTRINS OF IMPROVED STABILITY PREPARED BY ENZYMIC HYDROLYSIS OF DEXTROSE
 3974034 - MALTO-DEXTRINS OF IMPROVED STABILITY PREPARED BY ENZYMIC HYDROLYSIS OF DEXTROSE
 4009074 - PREPARATION OF LEVELOSE FROM GRANULAR STARCH
 4009075 - METHOD OF TREATING A DEXTROSE SOLUTION
 4009076 - ENZYMICALLY PRODUCED MALTOSE-MALTOTRIOSE STARCH HYDROLYSATE
 4113509 - DEXTROSE PRODUCTION WITH IMMOBILIZED GLUCAMYLASE
 4132595 - PROCESS FOR PREPARING MALTOSE-CONTAINING STARCH HYDROLYZATE AND CRYSTALLIZATION OF MALTOSE THEREFROM
 4199372 - GLUCAMYLASE IMMOBILIZED ON CATIONIC COLLOIDAL SILICA
 4202939 - NOVEL MALTOSE-CONTAINING SYRUPS AND PROCESS FOR MAKING THE SAME
 4217413 - PROCESS FOR SEPARATING AND RECOVERING VITAL WHEAT GLUTEN FROM WHEAT FLOUR AND THE LIKE
 4217414 - METHOD USING GLUCAMYLASE IMMOBILIZED ON POROUS ALUMINA
 4226937 - STARCH HYDROLYSIS AT HIGH DRY SUBSTANCE
 4235965 - HIGHLY THERMOSTABLE GLUCAMYLASE AND PROCESS FOR ITS PRODUCTION
 4247637 - PROCESS FOR IMMOBILIZING GLUCOSE ISOMERASE
 4252959 - NOVEL METHOD OF CONTINUOUS ISOMERIZATION OF GLUCOSE
 4253000 - IMMOBILIZED ENZYMES
 4263400 - PREPARATION OF HIGH FRUCTOSE SYRUPS FROM SUCROSE
 4276379 - HEAT AND ACID-STABLE ALPHA-AMYLASE ENZYMES AND PROCESSES FOR PRODUCING THE SAME
 4284722 -
- OOS KROYER A/S
 3910820 - METHOD OF MAKING STARCH HYDROLYSATES BY ENZYMIC HYDROLYSIS
- ONKI KAGAKU KOGYO KABUSHIKI KAISHA
 3915797 - IMMOBILIZED ENZYMES
 4205128 - PROCESS FOR PRODUCING IMMOBILIZED ENZYME COMPOSITIONS
- DIAMOND SHAMROCK (POLYMERS) LIMITED
 4217417 - RESIN CHELATES
- DIRECTOR OF NATIONAL FOOD RESEARCH INSTITUTE
 4001082 - METHOD OF ISOMERIZING GLUCOSE WITH ENZYME IMMOBILIZED WITHIN MICROBIAL CELL
- OOW CHEMICAL COMPANY
 4246350 - PROTEIN IMMOBILIZATION ON CHELATING RESINS
 4308349 - ISOMERIZATION OF GLUCOSE TO FRUCTOSE USING GLUCOSE ISOMERASE FROM AMPULLARIELLA
- E. I. DU PONT DE NEMOURS AND COMPANY
 4039383 - PROCESS FOR PRODUCING MALTOPENTAPOSE
 ESCHER WYSS GMBH
 4254150 - PROCESS FOR PRODUCING A FOODSTUFF OF CEREAL

STARCH HYDROLYSATES

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

EXXON RESEARCH + ENGINEERING CO.

3616222 - PROCESS FOR SACHARIFICATION OF CELLULOSIC AND WOODY TISSUES BY FUNGI OR ENZYMES FROM FUNGI

GENERAL FOODS CORPORATION

3565764 - SUGAR PRODUCTION FROM AMYLACEOUS MATERIALS

GIST-BROCADES N.V.

3838007 - WATER-INSOLUBLE ENZYME COMPOSITION

GLAXO LABORATORIES LIMITED

3697378 - OXYMINIZATION OF STARCH WITH X-AMYLASE FROM BACILLUS COAGULANS

3800742 - BETA-1,4./BETA1,3 GLUCANASE

4011136 - BIOCHEMICAL PROCESS

GRAIN PROCESSING CORPORATION

3663369 - HYDROLYSIS OF STARCH

4241183 - STARCH LIQUEFACTION PROCESS

4298400 - LOW O.E. STARCH CONVERSION PRODUCTS

GREAT WESTERN SUGAR COMPANY

4007323 - ENZYMIC METHOD OF PRODUCING GLUCOSE FROM ETHYLENE TREATED CELLULOSE

4241185 - METHOD OF STABILIZING +80 -GALACTOSIDASE

HAYASHIBARA BIOCHEMICAL LABORATORIES INCORPORATED

3812011 - METHOD OF CONVERTING STARCH TO BETA-CYCLODEXTRIN

3832285 - METHOD OF PRODUCING MALTOSE OF HIGH PURITY

3989206 - HEAT STABLE CYCLODEXTRIN GLYCOSYLTRANSFERASE

4028186 - PROCESS FOR THE PRODUCTION OF SACCHARIFIED STARCH PRODUCTS

HAYASHIBARA COMPANY

3492203 - PRODUCTION OF BETA-AMYLASE FROM WHEAT BRAN

3677895 - PROCESS FOR PREPARING LONG-CHAIN AND SHORT-CHAIN AMYLOSES FROM STARCHES

3677896 - PROCESS FOR PREPARING CRYSTALLINE MALTOSE

3691013 - PROCESS FOR PRODUCING KETOSE

3692580 - PROCESS FOR THE PRODUCTION OF STARCH SYRUPS

3701714 - PROCESSES FOR THE PRODUCTION OF OLIGOSACCHARIDE HAVING FRUCTOSE MOLECULES ON THEIR REDUCING ENDS

3705039 - LOW CALORIE SWEETENER MIXTURE OF MALTIITOL AND MALTOITRITOL

3713978 - PROCESS FOR PREPARING POWDERY STARCH SUGARS

3721605 - PROCESS FOR PRODUCING AMYLOSE IN INDUSTRIAL SCALE

3728132 - PROCESS FOR THE PRODUCTION OF FOODS AND DRINKS

3729380 - PROCESS FOR PRODUCING LOW MOLECULAR AMYLOSE ON A COMMERCIAL BASIS

3760810 - PROCESS FOR PRODUCING LOW MOLECULAR AMYLOSES

3760814 - METHOD FOR THE SEPARATION AND PURIFICATION OF AMYLOSES

3789584 - PROCESS FOR THE PREPARATION OF AMYLOSE AS THE SUBSTRATE FOR THE QUANTITATIVE ANALYSIS OF AMYLASE

3795956 - PROCESS FOR PRODUCING HIGH PURITY MALTOSE

3804715 - PROCESS FOR PREPARING SUGAR CONTAINING MALTOSE OF HIGH PURITY

3806977 - PROCESS FOR PRODUCING AMYLOSES

3838005 - METHODS FOR THE FRACTIONATION OF AMYLOSES

3870704 - PROCESS FOR PRODUCING HEAT-RESISTANT STARCH SYRUPS

3881991 - NITROGEN CONTAINING AMYLOSE DERIVATIVES

4001435 - PROCESS FOR PRODUCING AMYLOSE POWDERS HAVING A MEAN DEGREE OF POLYMERIZATION BETWEEN 20-30

4016038 - PROCESS FOR PREPARING FOODS AND DRINKS

4016038 - PROCESS FOR PREPARING MALTOSES FROM STARCHES

HIRAW WALKER SONS, INC.

3868307 - PRODUCTION OF O1STILLERS YEAST

STARCH HYDROLYSATES

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ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

HOFFMANN-LA ROCHE INC.

3912592 - METHOD FOR PRODUCING L-SORBOSONE

HOKKAIDO SUGAR COMPANY, LTD.

4036694 - PROCESS FOR BEET SUGAR PRODUCTION

ICI AMERICAS INC.

4173514 - HIGH MANNITOL PROCESS (ENZYMATIC ISOMERIZATION)

4292451 - HIGH MANNITOL PROCESS (ALKALINE HYDROGENATION IN PRESENCE OF ALKALI METAL CARBONATE)

IMPERIAL CHEMICAL INDUSTRIES LIMITED

4059489 - PRODUCTION OF GLUCOSE ISOMERASE

4069104 - CONVERSION OF GLUCOSE TO KETOSE IN THE PRESENCE OF OXYANIONS OR MIXED OXYANIONS OF TIN OR GERMANIUM

4234687 - +62 -GALACTOSIDASE

I. N. R. A.

4188466 - AUTOMATIC METHOD FOR THE DETERMINATION OF STARCH

KABUSHIKI KAISHA HAYASHIBARA SEIBUTSU KAGAKU KENKYUJO

4219571 - PROCESS FOR PRODUCING A SWEETENER

4254227 - PROCESSES FOR PRODUCING SYRUPS OF SYRUP SOLIDS CONTAINING FRUCTOSE-TERMINATED OLIGOSACCHARIDES

KABUSHIKI-KAISHA HAYASHIBARA SELBUTSUKAGAKU KENKYUJO

4032403 - PROCESS FOR THE PRODUCTION OF SACCHARIFIED STARCH PRODUCTS WHEREIN MALTOSE IS THE PREDOMINANT CONSTITUENT

KAYASHIBARA COMPANY

3703440 - PROCESS FOR THE PRODUCTION OF STARCH SYRUPS THAT HAVE FRUCTOSE ON THEIR MOLECULAR ENDS

KEN HAYASHIBARA

3819484 - PROCESS FOR PREPARING SUCROSE-STARCH SWEETENER FREE FROM REDUCING SUGAR

KOCH-LIGHT LABORATORIES LIMITED

4043869 - WATER INSOLUBLE BIOLOGICALLY ACTIVE MATERIAL

KOCKUMS CONSTRUCTION AB

4282319 - PROCESS FOR THE PREPARATION OF A HYDROLYZED PRODUCT FROM WHOLE GRAIN

KURTH MALTING CORPORATION

4251630 - PREPARATION OF MALT HIGH IN ALPHA-1,6-HYDROLASE

KYOWA HAKKO KOGYO CO., LTD.

3458401 - PROCESS FOR THE FERMENTATIVE PRODUCTION OF D-RIBOSE PHOSPHATES

3637451 - PROCESS FOR PRODUCING FATTY ACID ESTERS OF SUGARS

3639210 - FERMENTATION PROCESSES UTILIZING GASEOUS HYDROCARBONS

3642575 - PROCESS FOR PRODUCING SUGARS BY FERMENTATION

LAEVOSAN-GESELLSCHAFT CHEM. PHARM. INDUSTRIE FRANK +

3812010 - METHOD OF PRODUCING FRUCTOSE AND GLUCOSE FROM SUCROSE

LIFELINE PRODUCTS, INC.

4234686 - STARCH-DEGRADING ENZYMES DERIVED FROM +1 CLADOSPORIUM RESINAE

LYCKEY STARKELSEFORADLING AB

3651221 - SUGAR SUBSTITUTE ADDITIVE PREPARATIONS OF SORBITOL AND GLUCONIC ACID

STARCH HYDROLYSATES

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

MEIJI SEIKA KAISHA LTD.

3864864 - PRODUCTION OF MALTOSYL AMYLASES PRODUCED BY STREPTOMYCES
3998696 - METHOD FOR PRODUCING MALTOSYL
4294623 - METHOD OF PRODUCING HIGH PURITY MALTOSYL

MERCK & CO., INC.

4175007 - PROCESS FOR PRODUCING ANTIBIOTIC A21A

MERCK E. A. G.

3591457 - ENZYMAIC DECOMPOSITION OF GLUCANS

MERCK PATENT GESELLSCHAFT MIT BESCHRANKTER HAFTUNG

3713980 - PROCESS FOR THE PREPARATION OF PERUVOSIDE

MEUR SEIKA KAISHA, LTD.

3804717 - PRODUCTION OF NEW AMYLASES BY CULTIVATION OF STREPTOMYCES AND USES OF THESE NEW AMYLASES

MILES LABORATORIES INC.

3874064 - TOUFEACTION PROCESS
3974068 - PROCESS FOR CONDITIONING BACTERIAL CELLS CONTAINING GLUCOSE ISOMERASE ACTIVITY
4061541 - PREPARATION OF ALKALINE ALPHA-AMYLASE
4212943 - PRODUCTION OF BACTERIAL CELL AGGREGATE
4251632 - PREPARATION OF A BACTERIAL CELL AGGREGATE

MITSUBISHI CHEMICAL INDUSTRIES LTD.

4008124 - PROCESS FOR THE ISOMERIZATION OF GLUCOSE INTO FRUCTOSE
4113568 - PROCESS FOR THE RENEWAL OF AN INSOLUBILIZED GLUCOSE ISOMERASE

MONSANTO COMPANY

3829464 - LIQUEFYING STARCHES
3829464 - PROCESS FOR THE PREPARATION OF DEXTROSE USING ALPHA
3646457 - ENZYMAIC PROCESSING WITH POLYMER-ENZYME PRODUCT
4013514 - PREPARING A REACTOR CONTAINING ENZYMES ATTACHED TO DIALDEHYDE CELLULOSE

NALCO CHEMICAL COMPANY

3591455 - CONTINUOUS MICROBIAL PROCESS

NATIONAL OISTILLERS AND CHEMICAL CORPORATION

4247638 - RECOVERY OF STARCH FROM AMYLACEOUS ROOTS AS AN AQUEOUS SLURRY
4260627 - PROCESS FOR THE HYDROLYSIS OF STARCH AND FERMENTABLE HYDROLYSATES OBTAINED THEREFROM
4287304 - FERMENTABLE SUGAR FROM THE HYDROLYSIS OF STARCH DERIVED FROM DRY MILLED CORN

NATIONAL STARCH AND CHEMICAL CORPORATION

3525672 - LOW TEMPERATURE STABLE STARCH PRODUCTS

NIPON RIKI SEISHI KABUSHIKI KAISHA

3770672 - PASTE FOR GUMMED TAPE AND PROCESS FOR PRODUCING THE SAME FROM HYDROLYZED STARCH

NOVO INDUSTRI A/S

3912590 - PROCEDURE FOR LIQUEFYING STARCH
4021383 - PROCEDURE FOR LIQUEFYING STARCH
4021389 - PROCESS AND ISOMERIZING GLUCOSE
4206284 - SACCHARIFICATION OF GLUCOSE RAFFINATE OR MOTHER LIQUORS
4206285 - SACCHARIFICATION OF ENRICHED FRUCTOSE CONTENT SYRUPS

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

- NOVO LABORATORIES, INCORPORATED
 4138290 - GLUCOSE ISOMERIZATION UNDER EXPANDED BED CONDITIONS
- OXFORD PAPER COMPANY
 3513072 - INACTIVATION OF ALPHA AMYLASE ENZYMES BY FLUOROSILICATE COMPOUNDS
- PENICK + FORD LIMITED
 4029742 - METHOD FOR CONTINUOUS PREPARATION OF COOKED THINNED STARCH PASTES
 4029546 - COLUMN APPARATUS AND PROCESS FOR IMMOBILIZED ENZYME REACTIONS
 4033820 - STARCH SPONGE COLUMN APPARATUS AND PROCESS FOR IMMOBILIZED ENZYME REACTIONS
 4304857 - WHOLE CELL ENZYME COMPOSITION CONTAINING FUMED SILICA
- PFEIFER + LANGEN
 3939281 - EXTRACTION OF FAT FROM STARCH-CONTAINING VEGETABLE MATTER
- PHILLIPS PETROLEUM COMPANY
 4302542 - FERMENTATION WITH THERMOPHILIC MIXED CULTURES
- PILLSBURY COMPANY
 3422288 - PROCESS FOR PREPARING GENTIOBIOSE
- PROJEKTIERUNG CHEMISCHE VERFAHRENSTECHNIK GMBH
 4300692 - PROCESS FOR THE PRODUCTION OF XULOSE BY ENZYMATIC HYDROLYSIS OF XYLAN
- PURDUE RESEARCH CORPORATION
 4266981 - PROCESS FOR RECOVERING AND UTILIZING CELLULOSE USING SULFURIC ACID
- PURDUE RESEARCH FOUNDATION
 4266675 - NONTXIC CELLULOSE SOLVENT AND PROCESS FOR FORMING AND UTILIZING THE SAME
 4281063 - PROCESS FOR TREATING CELLULOSIC MATERIALS AND OBTAINING GLUCOSE THEREFROM
- REDPATH SUGARS LIMITED
 4176006 - ENZYME IMMOBILIZATION WITH A DISULPHIDE BRIDGE
- RESEARCH CORPRATION
 3790446 - CYTDPHAGA ISOMYLASE
 4116770 - WAXY BARLEY STARCH WITH UNIQUE SELF-LIQUEFYING PROPERTIES
- RESEARCH PRODUCTS REHDVOT LTD.
 4251631 - CROSS-LINKED ENZYME MEMBRANE
- RHONE POULENC INDUSTRIES
 4264732 - ENZYMATIC COMPOSITIONS FOR ISOMERIZING GLUCOSE INTO LEVULOSE
- RHONE-POULENC S. A.
 3990943 - PROCESS FOR THE ENZYMATIC ISOMERIZATION OF GLUCOSE TO LEVULOSE
- RIKAGAKU, KENKYUSHO
 3923598 - PROCESS FOR PRODUCING CYCLODEXTRINS
 4135977 - PROCESS FOR PRODUCTION OF CYCLODEXTRIN
- R. J. REYNOLDS TOBACCO COMPANY
 3645848 - PROCESS OF PREPARING GLUCOSE ISOMERASE
 3821086 - ENZYMATIC PROCESS USING IMMOBILIZED MICROBIAL CELLS
 3935068 - ENZYMATOUS ISOMERIZATION OF GLUCOSE INTO IMMOBILIZED FLOCCULATE ENZYME
 3935069 - ENZYMATIC PROCESS USING IMMOBILIZED MICROBIAL CELLS

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

R. J. REYNOLDS TOBACCO COMPANY (CONTINUED)

4060456 - GLUCOSE ISOMERIZATION PROCESS
 4061539 - PREPARATION AND USE OF GLUCOSE ISOMERASE
 4179335 - THERMOSTABLE LACTASE DERIVED FROM +I BACILLUS COAGULANS
 4283496 - PREPARATION AND USE OF GLUCOSE ISOMERASE

ROHM AND HAAS COMPANY

4622266 - PROCESS FOR RENDERING INNOCUOUS FLATULENCE PRODUCING SACCHARIDES
 4660236 - CATALYTIC PROCESS UTILIZING HOLLOW FIBER MEMBRANES

ROUETTE FRERES

3890300 - STARCH HYDROLYSATE METHODS FOR ITS PREPARATION AND PRODUCTS BASED THEREON

4279931 - NON-CARTIOGENIC HYDROGENATED STARCH HYDROLYSATE FOR CONFECTIONERY AND PROCESS FOR PREPARING THIS HYDROLYSATE

SHOWA SANGYO KABUSHIKI KAISHA

4106987 - METHOD OF ISOMERIZING GLUCOSE TO FRUCTOSE

SNAM PROGETTI S. P. A.

4291123 - PRODUCTION OF FRUCTOSE AND FRUCTOSE-BASE SYRUPS AND MEANS FOR CARRYING OUT SUCH PRODUCTION

SNOW BRAND MILK PRODUCTS, CO., LTD.

4242450 - METHOD OF HYDROLYZING SUGAR, PROTEIN OR THE LIKE AND APPARATUS THEREFOR

STAMICARBON B. V.

4277563 - PREPARATION OF FRUCTOSE

STANOARD BRANDS INCORPORATED

3425909 - METHOD OF CONVERTING STARCH
 3543545 - METHOD FOR ISOMERIZING GLUCOSE SYRUPS
 3573845 - METHOD FOR PREPARING DEXTROSE CONTAINING SYRUPS
 3630845 - PROCESS FOR PREPARING DEXTROSE CONTAINING SYRUPS
 3644126 - METHOD OF MAKING A STARCH CONVERSION SYRUP
 3654080 - PROCESS FOR ISOMERIZING GLUCOSE TO FRUCTOSE
 3660236 - PRODUCTION OF GLUCAMYLASE
 3689361 - CYANETHYL STARCH
 3694314 - PROCESS FOR ISOMERIZING GLUCOSE TO FRUCTOSE
 3784409 - PROCESS FOR PURIFYING GLUCOSE SYRUPS CONTAINING FRUCTOSE
 3788945 - PROCESS FOR ISOMERIZING GLUCOSE TO FRUCTOSE
 3817832 - PROCESS FOR ISOMERIZING GLUCOSE TO FRUCTOSE
 3829362 - PROCESS FOR ENZYMATICALLY ISOMERIZING GLUCOSE TO FRUCTOSE
 3834940 - METHOD OF REFINING AN ENZYMATICALLY PRODUCED FRUCTOSE-CONTAINING SOLUTION
 3909354 - PROCESS FOR ISOMERIZING GLUCOSE TO FRUCTOSE
 4011137 - PROCESS FOR PRODUCING DEXTROSE USING MIXED IMMOBILIZED ENZYMES
 4089745 - PROCESS FOR ENZYMATICALLY CONVERTING CELLULOSE DERIVED FROM CORN HULLS TO GLUCOSE
 4096036 - METHOD FOR THE SEPARATION OF WATER SOLUBLE POLYOLS
 4102745 - PROCESS FOR PRODUCING DEXTROSE USING MIXED IMMOBILIZED ENZYMES
 4288548 - PROCESS FOR ISOMERIZING GLUCOSE TO FRUCTOSE

TAKEDA CHEMICAL INDUSTRIES, LTD.

3656444 - METHOD FOR THE PRODUCTION OF D-RIBOSE
 3919046 - METHOD OF PRODUCING D-RIBOSE
 3970822 - METHOD FOR THE PRODUCTION OF D-RIBOSE

TANABE SEIYAKU CO. LTD.

3484255 - PREVENTION OF CLOUDING OF SYRUP IN WHICH CANNED ORANGE SEGMENTS ARE PRESERVED

STARCH HYDROLYSATES

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ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

TANABE SEIYAKU CO. LTD. (CONTINUED)

4081327 - PREPARATION OF D-FRUCTOSE

4090919 - WATER-INSOLUBLE TANNIN PREPARATION FOR IMMOBILIZATION OF PROTEINS

TECHNICON INSTRUMENTS CORPORATION

4217415 - IMMOBILIZATION OF AN ENZYME SUBSTRATE

TORAY INDUSTRIES INC.

4275156 - GLUCOSE ISOMERASE IMMOBILIZED PRODUCT AND PROCESS FOR PREPARING SAME

TOWA KASEI KOGYO CO., LTD.

4083881 - PROCESS FOR PREPARING D-MANNITOL

TOYO HAKKA KOGYO KABUSHIKI KAISHA

3986482 - MENTHOL GLYCOSIDE, PROCESS FOR PREPARING THE SAME AND METHOD FOR RELEASING MENTHOL THEREFROM

TRUSTEES OF DARTMOUTH COLLEGE

4237226 - PROCESS FOR PRETREATING CELLULOSIC SUBSTRATES AND FOR PRODUCING SUGAR THEREFROM

UNITED STATES OF AMERICA, AGRICULTURE

3583894 - ENZYME PREPARATION OF HESPERETIN DIHYDROCHALCONE GLUCOSIDE

UNITED STATES OF AMERICA, ARMY

3642580 - ENZYMATIC SACCHARIFICATION OF CELLULOSE

3764475 - ENZYMATIC HYDROLYSIS OF CELLULOSE TO SOLUBLE SUGARS

UNITED STATES OF AMERICA, DEPARTMENT OF ENERGY

3972775 - CONVERSION OF CELLULOSIC MATERIALS TO SUGAR

4032407 - TAPERED BED BIOREACTOR

UNITED STATES OF AMERICA, NAVY

4089746 - METHOD FOR INSOLUBILIZING ENZYMES ON CHITOSAN

UNIVERSITY OF ARKANSAS FOUNDATION

4220721 - METHOD FOR ENZYME REUTILIZATION

WENGER MANUFACTURING

4286058 - ENZYMATIC CONVERSION OF HIGH MOISTURE SHEAR EXTRUDED AND GELATINIZED GRAIN MATERIAL

WORTHINGTON BIO-CHEMICAL CORPORATION

4304854 - ALPHA-AMYLASE ASSAY AND SUBSTRATES FOR USE THEREIN

W. R. GRACE + CO.

3929574 - USE OF ENZYMES BOUND TO POLYURETHANE

STARCH HYDROLYSATES - PART 2D

INVENTORS OF INDIVIDUALLY OWNED PATENTS (1/75-12/81)

(ALPHA LISTING)

INVENTOR NAME	STREET	CITY	ST	ZIP/CNTRY	PAGE D
CANTRELL 4091116 -	PETER MORRIS 722 ANZAC PARADE ADJUSTING THE PROPORTION OF A SUBSTANCE BY ENZYME TREATMENT	KENSINGTON, NEW SOUT	PA	AU	
CHARLES 4016293 - 4048018 -	MARVIN 622 N. 29 ST. METHOD OF CARRYING OUT ENZYME CATALYZED REACTIONS METHOD OF CARRYING OUT ENZYME CATALYZED REACTIONS	ALLENTOWN	PA	18104	
COUGHLIN 3928143 - 4016293 - 4048018 -	ROBERT W. 902 SEVENTH AVE. METHOD OF CARRYING OUT ENZYME-CATALYZED REACTIONS METHOD OF CARRYING OUT ENZYME CATALYZED REACTIONS METHOD OF CARRYING OUT ENZYME CATALYZED REACTIONS	BETHLEHEM	PA	18018	
EDWARDS 4091116 -	RONALD ALEXANDER 56 SAUNDERS BAY ROAD ADJUSTING THE PROPORTION OF A SUBSTANCE BY ENZYME TREATMENT	CARINGBAH, NEW SOUTH		AU	
GIACIN 4092219 -	JACK R. 2 STANWORTH LA. PREPARATION OF ENZYME-MEMBRANE COMPLEXES	ALLENTOWN	NJ	08501	
GILBERT 4092219 -	SEYMOUR G. 74 N. ROSS HALL BLVD. PREPARATION OF ENZYME-MEMBRANE COMPLEXES	PISCATAWAY	NJ	08854	
GREGOR 4033817 -	HARRY P. 150 LAKEVIEW AVE. PRESSURE-DRIVEN ENZYME-COUPLED MEMBRANES	LEONTIA	NJ	07605	
LEIDER 4092219 -	JOSEPH G. 379 HUFF RD. PREPARATION OF ENZYME-MEMBRANE COMPLEXES	NORTH BRUNSWICK	NJ	08902	
LIN 4092219 -	PO-MIN 714 BEVIER RD. PREPARATION OF ENZYME-MEMBRANE COMPLEXES	PISCATAWAY	NJ	08854	
MILLER 4091116 -	JOHN JAMES 2 PARADISE AVENUE ADJUSTING THE PROPORTION OF A SUBSTANCE BY ENZYME TREATMENT	ROSEVILLE, NEW SOUTH		AU	
MILNER 3928195 -	JEREMIAH 41, N. JOHN ST. PROCESS FOR THE PRODUCTION OF GLUCOSE POLYMERS	LIVERPOOL, L2 6SE		EN	
MULLER 4069103 -	HANS 1M ALLMENDOLI PROCESS FOR RECOVERING DEXTROSE AND DEXTRINS FROM PROTEIN-CONTAINING STARCH PRODUCTS	8703 ERLENBACH		CH	

PATENTS (1/63-12/81) WITH NEITHER ASSIGNMENT NOR INVENTOR INFORMATION IN THE DATA BASE

3533940 -	METHOD FOR TREATING AN AQUEOUS MEDIUM WITH CHITOSAN AND DERIVATIVES OF CHITIN TO REMOVE AN IMPURITY	3108928
3592734 -	PROCESS FOR CONVERTING STARCH AND OTHER POLYSACCHARIDES INTO DEXTROSE AND MALTOS CONTAINING PRODUCTS	3251748
3655512 -	PROCESS FOR PRODUCING SACCHARIDES BY FERMENTATION	3249511
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United States Patent

Yagi et al.

[11] 4,317,881
[45] Mar. 2, 1982

PROCESS FOR PRODUCING CYCLODEXTRINS

- [54] **References Cited**
U.S. PATENT DOCUMENTS
- [75] Inventors: Yoshiaki Yagi, Fujiwara, Kagakui, Kono, Tokyo; Taji Imai, Chigasaki, all of Japan
- [73] Assignee: Sankyo-Ocean Co., Ltd., Tokyo, Japan
- [21] Appl. No.: 134,255
- [22] Filed: Mar. 26, 1980
- [30] Foreign Application Priority Data
Apr. 7, 1979 [JP] Japan 54/42290
- [31] Int. Cl.¹ C12N 9/00; C12P 18/18
- [32] U.S. Cl. 435/97; 435/98; 435/99
- [38] Field of Search 435/97, 435/99, 193

200

United States Patent

Heady

[11] 4,317,880
[45] Mar. 2, 1982

PROCESS FOR THE PRODUCTION OF FRUCTOSE POLYMERS AND HIGH FRUCTOSE SYRUPS

- [54] **References Cited**
U.S. PATENT DOCUMENTS
- [75] Inventor: Robert E. Heady, Park Forest, Ill.
- [73] Assignee: CPC International Inc., Englewood Cliffs, N.J.
- [21] Appl. No.: 156,154
- [22] Filed: Jan. 3, 1980
- [31] Int. Cl.¹ C12P 19/02; C12P 19/18; C12P 19/26
- [32] U.S. Cl. 435/94; 435/97; 435/105; 435/913; 435/911
- [38] Field of Search 435/94, 97, 101, 105, 435/913, 911

8 Claims, 6 Drawing Figures

United States Patent

Maselli et al.

[11] 4,321,323
[45] Mar. 23, 1982

CARBOHYDRATE PROCESS

- [54] **References Cited**
U.S. PATENT DOCUMENTS
- [75] Inventors: John A. Maselli, Wilton; Robert O. Horvath, Westport, both of Conn.
- [73] Assignee: Standard Brands Incorporated, New York, N.Y.
- [21] Appl. No.: 160,758
- [22] Filed: Jan. 19, 1980
- [31] Int. Cl.¹ C12P 7/26; C12P 19/02; C12P 19/04; C12P 19/06
- [32] U.S. Cl. 435/102; 435/106; 435/913; 435/919
- [38] Field of Search 435/102, 72, 148, 190, 435/147, 813, 819, 182

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- Hack's Chemical Dictionary, McGraw-Hill Book Co., New York, 571 (1969).

Primary Examiner—Eather M. Kespinger
Attorney, Agent, or Firm—Richard Kornuik

ABSTRACT

Disclosed are methods of producing glucosides which comprises enzymatically oxidizing glucose with gluco-oxidase in the presence of a hydrogen peroxide oxidant to produce a peroxide intermediate which is then continuously produced hydrogen peroxide from said first zone through a semi-permeable membrane into a second zone, said membrane being permeable only to compounds of a molecular weight of less than about 100.

11 Claims, No Drawings

- [54] FRUCTOSE PRODUCTION
[75] Inventor: Roger S. Leiser, Decatur, Ill.
[73] Assignee: A. E. Staley Manufacturing Company, Decatur, Ill.
[21] Appl. No.: 130,276
[22] Filed: Mar. 14, 1980

Related U.S. Application Data
[65] Continuation of Ser. No. 662,199, Feb. 26, 1976, abandoned.

- [51] Int. Cl. C12P 19/24; C12N 5/52
[52] U.S. Cl. 435/94; 435/214;
435/96; 435/97

[58] Field of Search 435/94, 188, 234, 313, 435/174, 171, 179, 180, 181

[56] References Cited
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3,979,281 9/1976 Outcrop et al. 435/94
4,025,389 5/1977 Postinen et al. 435/96

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Yoshinaka et al., "Studies on D-Glucose Isomerizing Activity of D-Xylose Grown Cells from *Bacillus coagulans*," *J. Ferment. Technol.*, vol. 21, No. 1, (1973), pp. 236-241.

Primary Examiner—Thomas Wiseman
Attorney, Agent, or Firm—M. Paul Hendrickson; Charles J. Meyerson

ABSTRACT
Fructose productivity and isomerase activity in immobilized cells and column operations employing immobilized cells or column operations employing immobilized cells are significantly improved by isomerizing a high solids feed syrup at pH 7.0-7.5 and 55° C. to 60° C. Without adding cobalt to the feed syrup, a 42% fructose syrup can be produced in 4,000 hours and yielding greater than 3,500 pounds of a 42% fructose syrup for each pound of isomerase can be achieved.

11 Claims, No Drawings

- [54] FERMENTATION PROCESS
[75] Inventor: Niels W. Lutzen, Ballerup, Denmark
[73] Assignee: Novo Industri A/S, Denmark
[21] Appl. No.: 119,034
[22] Filed: Feb. 6, 1980

[51] Int. Cl. C12P 19/20
[52] U.S. Cl. 435/96; 435/99;
435/102; 435/106; 435/107; 435/108; 435/109; 435/110; 435/111; 435/112; 435/113; 435/114; 435/115; 435/116; 435/117; 435/118; 435/119; 435/120; 435/121; 435/122; 435/123; 435/124; 435/125; 435/126; 435/127; 435/128; 435/129; 435/130; 435/131; 435/132; 435/133; 435/134; 435/135; 435/136; 435/137; 435/138; 435/139; 435/140; 435/141; 435/142; 435/143; 435/144; 435/145; 435/146; 435/147; 435/148; 435/149; 435/150; 435/151; 435/152; 435/153; 435/154; 435/155; 435/156; 435/157; 435/158; 435/159; 435/160; 435/161; 435/162; 435/163; 435/164; 435/165; 435/166; 435/167; 435/168; 435/169; 435/170; 435/171; 435/172; 435/173; 435/174; 435/175; 435/176; 435/177; 435/178; 435/179; 435/180; 435/181; 435/182; 435/183; 435/184; 435/185; 435/186; 435/187; 435/188; 435/189; 435/190; 435/191; 435/192; 435/193; 435/194; 435/195; 435/196; 435/197; 435/198; 435/199; 435/200; 435/201; 435/202; 435/203; 435/204; 435/205; 435/206; 435/207; 435/208; 435/209; 435/210; 435/211; 435/212; 435/213; 435/214; 435/215; 435/216; 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United States Patent

Ehrenthal Irving et al.

4,242,451

Dec. 30, 1980

(11)

(65)

[54] METHOD OF TREATMENT OF FLOCCULATED HOMOGENATE OF GLUCOSE ISOMERASE

[75] Inventor: Irving Ehrenthal, University City; Kenneth K. Shieh, St. Louis County; Barrett L. Scarlett, Clayton, Agilash, Rajapur, St. Louis, all of Mo.

[73] Assignee: Anheuser-Busch, Incorporated, St. Louis, Mo.

[21] Appl. No.: 88,013

[22] Filed: Oct. 25, 1979

[63] Continuation of Ser. No. 879,394, Dec. 12, 1977, abandoned.

[31] Int. Cl. C12P 9/24, C12N 1/14

[32] U.S. Cl. 435/94, 435/877

[58] Field of Search 435/94, 435/877

Related U.S. Application Data

Continuation of Ser. No. 879,394, Dec. 12, 1977, abandoned.

Continuation of Ser. No. 879,394, Dec. 12, 1977, abandoned.

Continuation of Ser. No. 879,394, Dec. 12, 1977, abandoned.

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Continuation of Ser. No. 879,394, Dec. 12, 1977, abandoned.

Continuation of Ser. No. 879,394, Dec. 12, 1977, abandoned.

Continuation of Ser. No. 879,394, Dec. 12, 1977, abandoned.

Continuation of Ser. No. 879,394, Dec. 12, 1977, abandoned.

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Continuation of Ser. No. 879,394, Dec. 12, 1977, abandoned.

Continuation of Ser. No. 879,394, Dec. 12, 1977, abandoned.

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3,915,600 1/1976 Annot et al. 195/11 F

3,980,231 9/1976 Annot et al. 195/68

4,001,082 1/1977 Lee et al. 195/11 F

4,060,456 11/1977 Long 195/11 F

4,144,127 3/1979 Beckmann et al. 435/76

Primary Examiner—Lionel M. Shapiro

Attorney, Agent, or Firm—Gravely, Lieder & Woodruff

ABSTRACT

This application concerns a method for treating a flocculated homogenate of whole cell glucose isomerase derived from the microorganism *Actinoplanes* so that the homogenate can be used in the preparation of a product extended into cylindrical-shaped particles. The critical step in this method is the addition of a water absorbent filter to the flocculated homogenate prior to the addition of the filter.

21 Claims, No Drawings

1 Claims, No Drawings

2 Claims, No Drawings

3 Claims, No Drawings

4 Claims, No Drawings

5 Claims, No Drawings

6 Claims, No Drawings

7 Claims, No Drawings

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24 Claims, No Drawings

25 Claims, No Drawings

26 Claims, No Drawings

27 Claims, No Drawings

28 Claims, No Drawings

29 Claims, No Drawings

30 Claims, No Drawings

United States Patent

Ehrenthal et al.

4,208,482

Jun. 17, 1980

(11)

(65)

[54] IMMobilIZATION OF GLUCOSE ISOMERASE

[75] Inventor: Irving Ehrenthal, University City; Keith E. Mann, Melville, both of Mo.

[73] Assignee: Anheuser-Busch, Incorporated, St. Louis, Mo.

[21] Appl. No.: 679,769

[22] Filed: Apr. 23, 1976

[31] Int. Cl. C12P 9/24, C12N 1/14

[32] U.S. Cl. 435/178, 435/94

[33] Field of Search 195/178, 195/179, 195/DIG. 11, 46 R

Reference Cited

U.S. PATENT DOCUMENTS

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3,844,988 9/1974 Smith et al. 195/68 X

3,844,988 9/1974 Smith et al. 195/68 X

3,956,065 5/1976 Iannas et al. 195/11 F

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Todd et al., Sucrose Inversion by Immobilized Yeast

8 Claims, No Drawings

9 Claims, No Drawings

10 Claims, No Drawings

11 Claims, No Drawings

12 Claims, No Drawings

13 Claims, No Drawings

14 Claims, No Drawings

15 Claims, No Drawings

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25 Claims, No Drawings

26 Claims, No Drawings

27 Claims, No Drawings

28 Claims, No Drawings

29 Claims, No Drawings

30 Claims, No Drawings

Calls in a Complete Mixing Reactor Biotechnology and Bioengineering, vol. XVII 1975, (pp. 481-497).

Ehrenthal et al., Free and Immobilized Glucose Isomerase from *Streptococcus Phaeochromogenes*, Applied Microbiology, vol. 21, No. 4, 1971 (pp. 588-593).

Nelson et al., Immobilization of Glucose Isomerase on Acrylic Monomers for Immobilization of Enzymes Biochimica et Biophysica Acta, vol. 268, 1972 (pp. 253-256).

Primary Examiner—David M. Nuff

Attorney, Agent, or Firm—Gravely, Lieder & Woodruff

ABSTRACT

Immobilized glucose isomerase is prepared by mixing 0.5 to 1.5 parts by weight whole microbial cells containing glucose isomerase with 1 to 2 parts by weight of a combining the resultant mixture with an organic solvent, recovering discrete particles of agar gel with the whole microbial cells entrapped therein and drying the agar gel particles to form immobilized glucose isomerase. The immobilized glucose isomerase is suitable for a continuous process to convert glucose to fructose.

8 Claims, No Drawings

9 Claims, No Drawings

10 Claims, No Drawings

11 Claims, No Drawings

12 Claims, No Drawings

13 Claims, No Drawings

14 Claims, No Drawings

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28 Claims, No Drawings

29 Claims, No Drawings

30 Claims, No Drawings

United States Patent

Ehrenthal et al.

4,230,802

Oct. 28, 1980

(11)

(65)

[54] UNREFINED GLUCOSE SYRUP AS SUBSTRATE BY GLUCOSE ISOMERIZING FROM GLUCOSE

[75] Inventor: Irving Ehrenthal, University City; Keith E. Mann, Melville, both of Mo.

[73] Assignee: Anheuser-Busch, Incorporated, St. Louis, Mo.

[21] Appl. No.: 666,629

[22] Filed: Jan. 5, 1976

[31] Int. Cl. C12P 9/24

[32] U.S. Cl. 435/94, 435/99

[58] Field of Search 195/31 F, 114, 46 R, 195/65, 31 R, 435/94, 99

References Cited

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3,813,318 5/1974 Anheuser et al. 195/11 F

3,910,820 10/1975 Holt et al. 195/21 R

FOREIGN PATENT DOCUMENTS

1295407 11/1972 United Kingdom 195/11 F

OTHER PUBLICATIONS

Chemical Abstracts, 81:3653u.

Primary Examiner—Thomas G. Wiseman

Attorney, Agent, or Firm—Gravely, Lieder & Woodruff

ABSTRACT

This application concerns a method of preparing high purity glucose syrup from glucose syrup (produced by an acid-enzyme or enzyme-enzyme conversion) by treating the substrate with glucose isomerizing enzyme without the addition of cobalt and/or magnesium salts.

7 Claims, No Drawings

8 Claims, No Drawings

9 Claims, No Drawings

10 Claims, No Drawings

11 Claims, No Drawings

12 Claims, No Drawings

13 Claims, No Drawings

[54] SACCHARIFICATION OF ENRICHED FRUCTOSE CONTENT SYRUPS

[75] Inventor: Paul Berge R. Poulsen; Susanne Rugh, both of Varde, Barre E. Norman, Varde, all of Denmark

[73] Assignee: Novo Industri A/S, Denmark

[21] Appl. No.: 863,077

[22] Filed: Dec. 21, 1977

[31] Int. Cl. C12P 19/24

[32] U.S. Cl. 435/94, 435/94

[33] Field of Search 435/803, 435/813

[34] Field of Search 195/31 R, 31 F, 115, 536/1, 121/46, 435/94, 99, 803, 813

Reference Cited

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3,935,070 1/1976 Saito et al. 195/11 F

4,096,036 6/1978 Iannas et al. 195/11 F

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48,22643 3/1971 Japan 195/11 F

OTHER PUBLICATIONS

Nakamura, et al., "Block Polymerization by Saccharification of High Fructose Content Syrup," J. Polym. Sci., Part A, vol. 4, No. 3, pp. 535-534.

Primary Examiner—Thomas G. Wiseman

Attorney, Agent, or Firm—Feldman, Wolfe & Waldron

ABSTRACT

Saccharification of low DP polyamides in syrup of high fructose content and low glucose content by short term contact with amyloglucosidase e.g. in heat labile form, to produce a syrup containing a continuous syrup concentration of 2-50 w/o solids in a continuous process employing immobilized AMG.

Suitable high fructose content low glucose syrup are products that result from fractionation of isosyrup are enriched 30-7% d.b.h. in fructose syrup.

2 Claims, 1 Drawing Figure

United States Patent

[10] 4,113,565

[11] 4,113,565

[12] Sep. 12, 1978

[13] Sep. 12, 1978

[14] Sep. 12, 1978

[15] Aug. 15, 1978

Hurst

[54] ION-THIOL ISOMERIZATION WITH IRON
IONISERASE SYSTEMS

[55] Inventor: Thomas L. Hurst, Decatur, Ill.

[56] Assignee: A. E. Salsky Manufacturing
Company, Decatur, Ill.

[57] Appl. No.: 780,332

[58] Filed: Dec. 13, 1976

[59] Related U.S. Application Data

[60] Continuation-in-part of Ser. No. 360,654, Mar. 20,
1975, Pat. No. 4,026,764.

[61] Int. Cl.⁷ C12 1/02

[62] Field of Search C12 1/02, 1/04, 1/06, 1/08, 1/10, 1/12, 1/14

[63] References Cited

[64] U.S. PATENT DOCUMENTS

[65] 3,633,933 1/1971 Coker et al. 195/31 F

[66] 3,596,066 5/1976 Coker et al. 195/31 F

[67] 3,579,036 8/1976 Bell 195/31 F

[68] 4,008,324 2/1977 Fujita et al. 195/31 F

[69] 4,026,764 5/1977 Hurst 195/31 F

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griseus," *Acta Biochimica et Biophysica Sinica*, vol.
14, No. 3, pp. 342-350 (1964).

Ferry et al., *Chemical Engineer's Handbook*, 4th ed.,
McGraw-Hill Book Co., New York, (1963) pp. 23-27.

Primary Examiner—Thomas G. Wiseman

Attorney, Agent, or Firm—M. Paul Hendrickson;

Charles J. Meyerson

[70] ABSTRACT

Iron ions may be effectively used as a metal activator or
co-activator in glucose isomerization when used
in conjunction with an iron ioniserase system, which
system is characterized as being able to cleave disulfide
linkages and including reducing reagents such as water-
soluble SO₂ producing metal salts, ascorbic acid, thio-
cyanide, thioglycolic acid, and other reducing agents.
The system is especially effective when used
in conjunction with at least one other metal ion effec-
tor such as magnesium, manganese or cobalt ions. Effec-
tive enzymes are disclosed for isomerization, where the
enzyme is a glucose isomerase, which is a magnesium-iron-thiol
activator-isomerase system.

16 Claims, No Drawings

10 Claims, No Drawings

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14 Claims, No Drawings

United States Patent

[10] 4,06,987

[11] 4,06,987

[12] Aug. 15, 1978

Kanno et al.

[54] METHOD OF ISOMERIZING GLUCOSE TO
FRUCTOSE

[55] Inventors: Tomotaka Kanno, Okagawa; Hiroaki
Watanabe, Yokohama; Shoshichi
Sano, Ageo, all of Japan

[56] Assignee: Showa Sangyo Co. Ltd., Tokyo,
Japan

[57] Appl. No.: 757,211

[58] Filed: Jan. 6, 1977

[59] Foreign Application Priority Data

[60] Jan. 6, 1976 [JP] 51,739

[61] Jan. 6, 1976 [JP] 14,462

[62] Int. Cl.⁷ C12D 13/00

[63] U.S. Cl. 195/31 F; 195/63

[64] Field of Search 195/31 F; 65, 68, D1G: 11

3 Claims, No Drawings

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United States Patent

[10] 4,088,538

[11] 4,088,538

[12] May 9, 1978

[13] May 9, 1978

[14] May 9, 1978

[15] Mar. 28, 1978

Schneider

[54] REVERSIBLY PRECIPITABLE
IRON-THIOL COMPLEX AND A
METHOD FOR ITS USE

[55] Inventor: Michel Schneider, Grand-Lancy,
Switzerland

[56] Assignee: Battelle Memorial Institute,
Switzerland

[57] Appl. No.: 690,094

[58] Filed: May 26, 1976

[59] Foreign Application Priority Data

[60] May 30, 1975 Switzerland 666/75

[61] Int. Cl.⁷ C08 5/08, C08 216/24

[62] C08 220/06; C12 13/02

[63] 195/63; 195/31 R;

[64] 195/31 F; 195/116; 195/D1G 11

[65] 195/63, 65, 116, 115, D1G 11

[66] Field of Search 195/63, 65, 116, 115, D1G 11

[67] References Cited

[68] U.S. PATENT DOCUMENTS

[69] 3,576,300 4/1971 Gould et al. 195/63 X

3,654,357 12/1971 Wild et al. 195/63

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4,011,564 10/1976 195/63

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1,533,317 5/1974 United Kingdom 195/63

Primary Examiner—Alvin E. Tinschlag

Attorney, Agent, or Firm—Robert E. Barns; Emanuel

J. Lobato; Bruce L. Adams

[70] ABSTRACT

A process for using and preparing a reversibly soluble
chemically active polymer enzyme product which
consists of an enzyme covalently bonded to a water
soluble polymer, such as polyacrylamide, polyvinyl
alcohol, carboxy methyl cellulose, and polyethylene
glycol which have carboxyl or amino side groups that
impair to the complex is reversible solubility.

10 Claims, No Drawings

10 Claims, No Drawings

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10 Claims, No Drawings

10 Claims, No Drawings

United States Patent

[10] 4,081,327

[11] 4,081,327

[12] Mar. 28, 1978

Chibata et al.

[54] PREPARATION OF D-FRUCTOSE

[55] Inventors: Ichiro Chibata, Saita; Tetsuya Tera,
Tadashi Sato, Tadashi, all
of Japan

[56] Assignee: Tohoku Soyaku Co., Ltd., Osaka,
Japan

[57] Appl. No.: 441,509

[58] Filed: Apr. 17, 1974

[59] Foreign Application Priority Data

[60] Apr. 24, 1973 Japan 44-48714

[61] Int. Cl.⁷ C12 13/00; C12K 1/00

[62] COTG 7/02

[63] U.S. Cl. 195/31 F; 195/54;

[64] 195/59; 195/63; 195/D1G 11

[65] Field of Search 195/63; D1G: 11, 102, 31 R

[66] References Cited

[67] U.S. PATENT DOCUMENTS

[68] 3,784,950 1/1974 Hsiao et al. 195/63 X

3,791,926 2/1974 Chiba et al. 195/39 X

3,817,432 2/1974 Miyata et al. 195/31 F

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erase from *Streptomyces Phaeochromogenes*, *Applied*
Microbiology, vol. 21, No. 4, 1971 (pp. 584-593).

Chibata et al., Immobilized Glucose Isomerase from
Callospora Saccharalis ATCC 8044, *Biochimica*
et *Biophysica Acta*, vol. 352, 1971 (pp. 246-254).

Primary Examiner—David M. Naff

Attorney, Agent, or Firm—Berman & Berman

[70] ABSTRACT

An immobilized glucose isomerase-producing microor-
ganism is reacted with D-glucose to produce D-fruc-
tose. Immobilization is carried out by polymerizing at
least one acryloyl monomer in an aqueous suspension
containing a glucose isomerase-producing microor-
ganism, a crosslinking agent, and a glucose isomerase,
acryloylamine, N,N'-lower alkylene-bis-acryloylamine,
bis(acryloyl)dimethyl ether and N,N'-di-acryloyl-
ethyleneurea.

14 Claims, No Drawings

14 Claims, No Drawings

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14 Claims, No Drawings

[54] NON-CARBOGENIC HYDROGENATED STARCH HYDROLYSATE AND PROCESS FOR CONFECTIONERY AND PROCESS FOR PREPARING THIS HYDROLYSATE

[75] Inventors: Francine Verwardte, Jean-Bernard Leites, Michel Huskette, all of France

[73] Assignee: Requette Press, France

[21] Appl. No.: 38,711

[22] Filed: May 14, 1979

[23] Foreign Application Priority Data

Dec. 11, 1978 (FR) France

[31] Int. Cl.

A23L 1/09; C13K 7/00

[32] U.S. Cl.

426/448; 426/448; 426/448

[33] Field of Search

426/658; 127/334; 435/979; 435/980

[34] References Cited

U.S. PATENT DOCUMENTS

Re. 3,539,99 9/1970 Conrad

2,822,820 9/1978 Campbell et al.

2,891,869 6/1959 Lancelotti

10 Claims, No Drawings

10 Claims, No Drawings

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10 Claims, No Drawings

[54] ENZYMATIC PRODUCTION OF A STARCH MALTOSE CONCENTRATE HAVING A HIGH MALTOSE CONTENT

[75] Inventor: Kai Brandstedt Martensson, Lund, Sweden

[73] Assignee: AB Staudex, Malmö, Sweden

[21] Appl. No.: 501,397

[22] Filed: Aug. 28, 1974

[23] Foreign Application Priority Data

Aug. 28, 1973 Sweden

[31] Int. Cl.

195/31 R; 195/31 R

[32] U.S. Cl.

195/31 R; 195/31 R

[33] Field of Search

195/31 R; 195/31 R

[34] References Cited

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3,671,906 7/1972 Kurnosev et al.

3,720,583 3/1973 Fisher et al.

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10 Claims, 1 Drawing Figure

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3,847,743 11/1974 Forgone et al.

3,849,253 11/1974 Harvey et al.

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Wolfe et al., "Enzyme Reactors for Industry", Process Biochemistry, vol. 6, No. 10, 1971, pp. 11-13.

Wolfe et al., "Enzyme Reactors for Industry", Process Biochemistry, vol. 6, No. 10, 1971, pp. 11-13.

Wolfe et al., "Enzyme Reactors for Industry", Process Biochemistry, vol. 6, No. 10, 1971, pp. 11-13.

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Wolfe et al., "Enzyme Reactors for Industry", Process Biochemistry, vol. 6, No. 10, 1971, pp. 11-13.

Wolfe et al., "Enzyme Reactors for Industry", Process Biochemistry, vol. 6, No. 10, 1971, pp. 11-13.

Wolfe et al., "Enzyme Reactors for Industry", Process Biochemistry, vol. 6, No. 10, 1971, pp. 11-13.

Wolfe et al., "Enzyme Reactors for Industry", Process Biochemistry, vol. 6, No. 10, 1971, pp. 11-13.

Wolfe et al., "Enzyme Reactors for Industry", Process Biochemistry, vol. 6, No. 10, 1971, pp. 11-13.

Wolfe et al., "Enzyme Reactors for Industry", Process Biochemistry, vol. 6, No. 10, 1971, pp. 11-13.

Wolfe et al., "Enzyme Reactors for Industry", Process Biochemistry, vol. 6, No. 10, 1971, pp. 11-13.

Wolfe et al., "Enzyme Reactors for Industry", Process Biochemistry, vol. 6, No. 10, 1971, pp. 11-13.

Wolfe et al., "Enzyme Reactors for Industry", Process Biochemistry, vol. 6, No. 10, 1971, pp. 11-13.

Wolfe et al., "Enzyme Reactors for Industry", Process Biochemistry, vol. 6, No. 10, 1971, pp. 11-13.

Wolfe et al., "Enzyme Reactors for Industry", Process Biochemistry, vol. 6, No. 10, 1971, pp. 11-13.

Wolfe et al., "Enzyme Reactors for Industry", Process Biochemistry, vol. 6, No. 10, 1971, pp. 11-13.

Wolfe et al., "Enzyme Reactors for Industry", Process Biochemistry, vol. 6, No. 10, 1971, pp. 11-13.

Wolfe et al., "Enzyme Reactors for Industry", Process Biochemistry, vol. 6, No. 10, 1971, pp. 11-13.

Wolfe et al., "Enzyme Reactors for Industry", Process Biochemistry, vol. 6, No. 10, 1971, pp. 11-13.

Wolfe et al., "Enzyme Reactors for Industry", Process Biochemistry, vol. 6, No. 10, 1971, pp. 11-13.

Wolfe et al., "Enzyme Reactors for Industry", Process Biochemistry, vol. 6, No. 10, 1971, pp. 11-13.

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Wolfe et al., "Enzyme Reactors for Industry", Process Biochemistry, vol. 6, No. 10, 1971, pp. 11-13.

Wolfe et al., "Enzyme Reactors for Industry", Process Biochemistry, vol. 6, No. 10, 1971, pp. 11-13.

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[54] GLUCOSE ISOMERIZATION UNDER EXPANDED BED CONDITIONS

[75] Inventors: William H. McMullen, Norwalk, Conn.; William Canali, Ridgewood, N.J.

[73] Assignee: Novo Laboratories, Incorporated, Wilton, Conn.

[21] Appl. No.: 079,448

[22] Filed: Apr. 22, 1976

[23] Foreign Application Priority Data

Dec. 11, 1974 (FR) France

[31] Int. Cl.

C13K 13/02

[32] U.S. Cl.

195/631; 195/631

[33] Field of Search

195/631; 195/631

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3,960,663 9/1976 Anzole et al.

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10 Claims, No Drawings

10 Claims, No Drawings

10 Claims, No Drawings

10 Claims, No Drawings

10 Claims, No Drawings

10 Claims, No Drawings

[54] ENZYMATIALLY PRODUCED HYDROLY

United States Patent

[11] 4,219,571

United States Patent

[11] 4,199,372

Miyake

Walton

[11] 4,199,372

PROCESS FOR PRODUCING A SWEETENER

[11] 4,219,571

United States Patent

[11] 4,199,372

[54] PROCESS FOR PRODUCING A SWEETENER

[11] 4,219,571

United States Patent

[11] 4,199,372

[75] Inventor: Toshi Miyake, Okayama, Japan

[11] 4,219,571

United States Patent

[11] 4,199,372

[73] Assignee: Kabushiki Kaisha Hayashibara

[11] 4,219,571

United States Patent

[11] 4,199,372

Shinshu Kagaku Kenkyukai

[11] 4,219,571

United States Patent

[11] 4,199,372

Okayama, Japan

[11] 4,219,571

United States Patent

[11] 4,199,372

[21] Appl. No.: 915,876

[11] 4,219,571

United States Patent

[11] 4,199,372

[22] Filed: Jun. 15, 1978

[11] 4,219,571

United States Patent

[11] 4,199,372

[51] Int. Cl.

[11] 4,219,571

United States Patent

[11] 4,199,372

[52] U.S. Cl.

[11] 4,219,571

United States Patent

[11] 4,199,372

[53] Field of Search

[11] 4,219,571

United States Patent

[11] 4,199,372

[58] Claims, 4 Drawing Figures

[11] 4,219,571

United States Patent

[11] 4,199,372

[54] DEXTROSE PRODUCTION WITH

[11] 4,219,571

United States Patent

[11] 4,199,372

[55] Immobilized Glucoamylase

[11] 4,219,571

United States Patent

[11] 4,199,372

[75] Inventors: Ronald E. Hebada, David J. Hall,

[11] 4,219,571

United States Patent

[11] 4,199,372

both of Naperville, Harry W. Lesh,

[11] 4,219,571

United States Patent

[11] 4,199,372

Willowbrook, Ill. of Ill.

[11] 4,219,571

United States Patent

[11] 4,199,372

[73] Assignee: CPC International Inc., Englewood

[11] 4,219,571

United States Patent

[11] 4,199,372

Cliffs, N.J.

[11] 4,219,571

United States Patent

[11] 4,199,372

[21] Appl. No.: 760,035

[11] 4,219,571

United States Patent

[11] 4,199,372

[22] Filed: Dec. 13, 1976

[11] 4,219,571

United States Patent

[11] 4,199,372

[51] Int. Cl.

[11] 4,219,571

United States Patent

[11] 4,199,372

[52] U.S. Cl.

[11] 4,219,571

United States Patent

[11] 4,199,372

[53] Field of Search

[11] 4,219,571

United States Patent

[11] 4,199,372

[54] DEXTROSE PRODUCTION WITH

[11] 4,219,571

United States Patent

[11] 4,199,372

[55] Immobilized Glucoamylase

[11] 4,219,571

United States Patent

[11] 4,199,372

[75] Inventors: Ronald E. Hebada, David J. Hall,

[11] 4,219,571

United States Patent

[11] 4,199,372

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[11] 4,219,571

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[11] 4,199,372

Willowbrook, Ill. of Ill.

[11] 4,219,571

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[11] 4,199,372

[73] Assignee: CPC International Inc., Englewood

[11] 4,219,571

United States Patent

[11] 4,199,372

Cliffs, N.J.

[11] 4,219,571

United States Patent

[11] 4,199,372

[21] Appl. No.: 760,035

[11] 4,219,571

United States Patent

[11] 4,199,372

[22] Filed: Dec. 13, 1976

[11] 4,219,571

United States Patent

[11] 4,199,372

[51] Int. Cl.

[11] 4,219,571

United States Patent

[11] 4,199,372

[52] U.S. Cl.

[11] 4,219,571

United States Patent

[11] 4,199,372

[53] Field of Search

[11] 4,219,571

United States Patent

[11] 4,199,372

[54] DEXTROSE PRODUCTION WITH

[11] 4,219,571

United States Patent

[11] 4,199,372

[55] Immobilized Glucoamylase

[11] 4,219,571

United States Patent

[11] 4,199,372

[75] Inventors: Ronald E. Hebada, David J. Hall,

[11] 4,219,571

United States Patent

[11] 4,199,372

both of Naperville, Harry W. Lesh,

[11] 4,219,571

United States Patent

[11] 4,199,372

Willowbrook, Ill. of Ill.

[11] 4,219,571

United States Patent

[11] 4,199,372

[73] Assignee: CPC International Inc., Englewood

[11] 4,219,571

United States Patent

[11] 4,199,372

Cliffs, N.J.

[11] 4,219,571

United States Patent

[11] 4,199,372

[21] Appl. No.: 760,035

[11] 4,219,571

United States Patent

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[22] Filed: Dec. 13, 1976

[11] 4,219,571

United States Patent

[11] 4,199,372

[51] Int. Cl.

[11] 4,219,571

United States Patent

[11] 4,199,372

[52] U.S. Cl.

[11] 4,219,571

United States Patent

[11] 4,199,372

[53] Field of Search

[11] 4,219,571

United States Patent

[11] 4,199,372

[54] DEXTROSE PRODUCTION WITH

[11] 4,219,571

United States Patent

[11] 4,199,372

[55] Immobilized Glucoamylase

[11] 4,219,571

United States Patent

[11] 4,199,372

[75] Inventors: Ronald E. Hebada, David J. Hall,

[11] 4,219,571

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both of Naperville, Harry W. Lesh,

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[11] 4,199,372

Willowbrook, Ill. of Ill.

[11] 4,219,571

United States Patent

[11] 4,199,372

[73] Assignee: CPC International Inc., Englewood

[11] 4,219,571

United States Patent

[11] 4,199,372

Cliffs, N.J.

[11] 4,219,571

United States Patent

[11] 4,199,372

[21] Appl. No.: 760,035

[11] 4,219,571

United States Patent

[11] 4,199,372

[11] 4,199,372

United States Patent

[11] 4,277,563
[45] Jul. 7, 1981

United States Patent
Pratt et al.

[11] 4,251,630
[45] Feb. 17, 1981

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56-10479 12/1975 Japan 435/105
- [57] **OTHER PUBLICATIONS**
Methods in Enzymology, vol. 8, pp. 625-627 (1966).
Primary Examiner—Lionel M. Shapiro
Attorney, Agent, or Firm—Cushman, Darby & Cushman
- [57] **ABSTRACT**
Fructose in a purified form is recovered from plant parts containing fructose polymer, such as inulin, by the action of fructose polymer hydrolizing enzyme, such as inulinase, followed by recovering the remaining solid plant parts and recovering fructose crystals from the aqueous solution.
- 9 Claims, No Drawings
- [56] **References Cited**
U.S. Pat. No. 95,680
Nov. 19, 1979
Filed: Nov. 19, 1979
Foreign Application Priority Data
Nov. 18, 1978 [NL] Netherlands 781139
- [51] Int. Cl. C12P 19/14
[52] U.S. Cl. 435/99, 435/276, 435/278
- [58] Field of Search 435/93, 99, 105, 276

- [54] **PREPARATION OF FRUCTOSE**
[75] Inventor: Pieter L. Kerkhoffs, Gelsen, Netherlands
[73] Assignee: Stankorbo, B.V., Gelsen, Netherlands
[21] Appl. No.: 95,680
[22] Filed: Nov. 19, 1979
[30] Foreign Application Priority Data
Nov. 18, 1978 [NL] Netherlands 781139
- [51] Int. Cl. C12P 19/14
[52] U.S. Cl. 435/99, 435/276, 435/278
- [58] Field of Search 435/93, 99, 105, 276

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DeClerck, J. A. Textbook of Brewing, vol. one Chapman & Hall Ltd., London 1957, (pp. 140-156 and 151-157).
A. Starch and its Derivatives, vol. 2, 3rd ed. Chapman & Hall Ltd. London, 1953, (pp. 78-80).
Primary Examiner—David M. Naff
Attorney, Agent, or Firm—Merriman, Marshall & Bicknell

ABSTRACT
Malt having a high content of alpha-1,6-hydrolase activity is prepared by germinating previously steeped barley until the average ascorbic acid reaches a length of at least 1.5 mm. The malt is then dried to contain at least 55 units of alpha-1,6-hydrolase activity per gram of malt. The malt provides more complete hydrolyzing of starch to glucose and maltose, and it is used in the production of malted barley and in producing distilled alcoholic beverages and in producing maltose syrup.

4 Claims, No Drawings

3,980,021 9/1975 Reberger et al. 426/16

4 Claims, No Drawings

United States Patent

[11] 4,266,027
[45] May 5, 1981

United States Patent
Muller et al.

[11] 4,266,981
[45] May 12, 1981

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3,660,548 9/1972 Katz 127/66 A
3,922,186 11/1975 Leach 435/99 X
3,922,188 11/1975 Leach 435/99 X
Primary Examiner—Sidney Marantz
Attorney, Agent, or Firm—Kenneth D. Tremain
- [57] **ABSTRACT**
An aqueous starch slurry is initially hydrolyzed in the presence of an enzyme and thereafter the starch is exchanged with a resin to provide a sterile aqueous solution containing at least about 60 weight percent fermentable sugar based on the weight of the original starch present.
- 17 Claims, 1 Drawing Figure
- [56] **References Cited**
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2,300,022 11/1942 Giordani 127/37
2,465,349 3/1949 Boehm 127/37
3,515,951 10/1965 Hess 127/37

- [54] **PROCESS FOR RECOVERING AND UTILIZING CELLULOSE USING SULFURIC ACID**
[75] Inventors: George T. Tsao, Terry Y. Chow, both of West Lafayette, Ind.
[73] Assignee: Purdue Research Corporation, West Lafayette, Ind.
[21] Appl. No.: 81,538
[22] Filed: Oct. 3, 1979
[51] Int. Cl. C12P 3/02
[52] U.S. Cl. 127/37; 62/76; 127/37; 435/99; 62/76; 127/37
- [58] Field of Search 127/37; 435/99; 62/76; 127/37

3,972,275 6/1976 While 435/99
Primary Examiner—Sidney Marantz
Attorney, Agent, or Firm—John R. Nesbitt, Robert E. Harris

ABSTRACT
A process for recovering cellulose using sulfuric acid and utilizing the recovered cellulose by hydrolysis to yield glucose. Cellulose raw materials are hydrolyzed with sulfuric acid to produce a glucose solution from which the solid residue is separated and is treated with concentrated sulfuric acid to dissolve cellulose contained therein. After blending and mixing of the residue with water or an organic solvent such as methanol, the recovered cellulose can then be hydrolyzed by conventional methods to yield glucose. High level recovery of the glucose acid is also disclosed.

19 Claims, No Drawings

AMINO ACIDS

This profile includes processes for preparing alpha or beta amino acids, substituted amino acids, or salts by a biological transformation of matter. The transforming agent may be a microorganism, an enzyme or immobilized enzyme, or animal or plant cell culture. The profile also includes processes where a racemic mixture is treated with a microorganism or enzyme to purify it or to liberate an optically active mixture or compound.

INCLUDED IN THIS PROFILE ARE ALL OF THE PATENTS FROM:

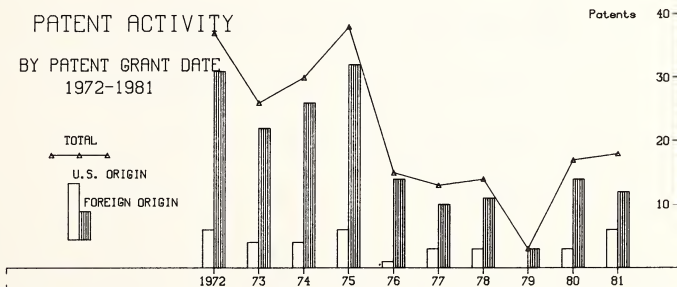
Class 435, Subclasses 106-116 and 280

ACTIVITY INDICES (1979-1981)

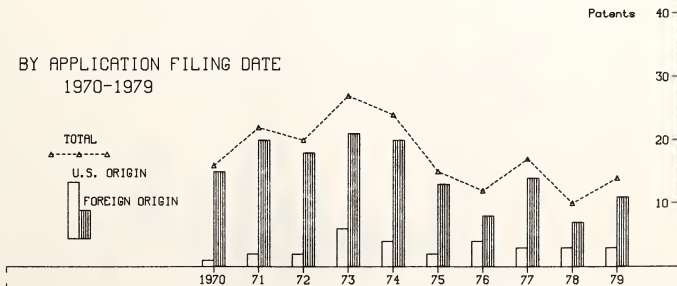
GROWTH	18.0%
FOREIGN SHARE	76.3%
CORPORATE OWNED	92.1%
GOVERNMENT OWNED	0.0%
U.S. OWNED OF FOREIGN	6.9%

PATENT ACTIVITY

BY PATENT GRANT DATE
1972-1981



BY APPLICATION FILING DATE
1970-1979



AMINO ACIDS - PART 2A

PATENT ACTIVITY (1/63-12/81) BY DATE OF PATENT GRANT

		NUMBER OF PATENTS														PAGE A	
		63-67	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	TOTAL
TOTAL		65	12	11	18	23	37	26	30	38	15	13	14	3	17	18	340
U.S. ORIGIN		22	3	6	2	4	6	4	4	6	1	3	3		3	6	73
FOREIGN ORIGIN		43	9	5	16	19	31	22	26	32	14	10	11	3	14	12	267
JAPAN		38	9	5	14	19	28	22	22	28	7	5	9	2	10	5	223
WEST GERMANY		3			1		1		2	1	4	1		1	1	3	13
FRANCE		1					1				1	2	1			1	6
UNITED KINGDOM		1					1			2	1	1			1	1	5
U.S.S.R.												1					4
SWEDEN									1	1	1					2	3
NETHERLANDS													1			1	1
ISRAEL																	1
CANADA									1								1
ARGENTINA					1												1
U.S. ORIGIN		22	3	6	2	4	6	4	4	6	1	3	3		3	6	73
U.S. CORP. OWNED		22	3	6	2	4	6	4	3	6	1	2	3		3	6	71
U.S. GOVT. OWNED																	
FOREIGN OWNED									1			1					1
FOREIGN ORIGIN		43	9	5	16	19	31	22	26	32	14	10	11	3	14	12	267
U.S. OWNED		2			1				1						2		6
FOREIGN OWNED		41	9	5	15	19	31	22	25	32	14	10	11	3	12	12	261
FOREIGN CORP.		38	8	5	12	18	31	22	24	31	13	9	11	3	11	10	246
FOREIGN GOVT.		1									1						2
FOREIGN INDIV.		2	1		3	1			1	1		1			1	2	13

AMINO ACIDS

PATENT ACTIVITY (PATENTS GRANTED 1/67-12/81) BY DATE OF PATENT APPLICATION

		NUMBER OF PATENTED APPLICATIONS														PAGE A	
PRE 68		1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	TOTAL	
TOTAL	49	43	18	16	22	20	27	24	15	12	17	10	14	5		292	
U.S. ORIGIN	16	7	1	1	2	2	6	4	2	4	3	3	3	1		55	
FOREIGN ORIGIN	33	36	17	15	20	18	21	20	13	8	14	7	11	4		237	
JAPAN	29	35	16	15	18	14	17	17	7	5	10	5	5	3		196	
WEST GERMANY	2		1		1	3	2	1	1	1	2	1	3	1		11	
FRANCE																7	
ITALY	1							1	1	2	1	1				6	
UNITED KINGDOM							1	1	1		1	1	2			5	
U.S.S.R.								1	1							4	
SPAIN																4	
NETHERLANDS							1		1							2	
ISRAEL					1						1		1			2	
CANADA																1	
ARGENTINA	1					1										1	
U.S. ORIGIN	16	7	1	1	2	2	6	4	2	4	3	3	3	1		55	
U.S. CORP. OWNED	16	7	1	1	2	2	5	4	2	3	3	3	3	1		53	
U.S. GOVT. OWNED																	
U.S. INDIV. OWNED										1						1	
FOREIGN OWNED							1									1	
FOREIGN ORIGIN	33	36	17	15	20	18	21	20	13	8	14	7	11	4		237	
U.S. OWNED	1															5	
FOREIGN OWNED	32	35	17	15	20	17	21	20	13	8	14	5	11	4		232	
FOREIGN ORIGIN	27	34	17	14	20	15	21	19	12	8	14	4	9	4		218	
FOREIGN CORP.	1															2	
FOREIGN GOVT.																2	
FOREIGN INDIV.	4	1	1	1	2	2		1	1			1	2			12	

AMINO ACIDS

Organizational Patenting: Ranked

NO. OF
PATENTS

ASSIGNEES WITH 2 OR MORE PATENTS (1969-1981)

64	KYOWA HAKKO KOGYO CO., LTD.
57	AJINOMOTO CO., INC.
13	TANABE SEIYAKU CO., LTD.
9	KANEGAFUCHI KAGAKU KOGYO KABUSHIKI KAISHA
7	HOFFMAN-LA ROCHE INC.
7	TAKEDA CHEMICAL INDUSTRIES LTD.
5	COMMERCIAL SOLVENTS CORP.
4	SNAM PROGETTI S.P.A.
3	IMPERIAL CHEMICAL INDUSTRIES LTD.
3	ASAHI KASEI KOGYO K.K.
3	AMERICAN HOME PRODUCTS CORP.
3	MERCK & CO., INC.
2	RHONE-POULENC INDUSTRIES
2	AGENCE NATIONALE DE VALORISATION DE LA RECHERCHE (ANVAR)
2	PHILLIPS PETROLEUM CO.
2	ETHYL CORP.
2	TORAY INDUSTRIES, INC.
2	DAI NIPPON PETROCHEMICAL CO., LTD.
2	UPJOHN CO.
2	EXXON RESEARCH & ENGINEERING CO.
2	AKTIEBOLAGET BOFORS
2	LOUISIANA STATE UNIVERSITY FOUNDATION

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

AGENCE NATIONALE DE VALORISATION DE LA RECHERCHE (ANVAR)

3940316 - PROCESS FOR THE PRODUCTION OF ORGANIC ACIDS BY BIOLOGICAL HYDROLYSIS
 3956481 - HYDROSOLUBLE EXTRACTS OF MYCOBACTERIA, THEIR PREPARATION AND USE

AJINOMOTO COMPANY INCORPORATED

3463704 - METHOD OF PRODUCING ALANINE BY ENZYME ACTION
 3527672 - METHOD OF PRODUCING L-LYSINE
 3528600 - METHOD OF PRODUCING L-ORNITHINE AND L-ISOLEUCINE BY FERMENTATION
 3532601 - FERMENTATIVE PREPARATION OF THREONINE BY FERMENTATION
 3533914 - METHOD OF PRODUCING L-GLUTAMIC ACID BY FERMENTATION
 3546070 - PREPARATION OF L-GLUTAMINE AND L-SERINE FROM DL-SERINE
 3548170 - PROCESS OF PRODUCING L-GLUTAMIC ACID BY FERMENTATION
 3550810 - FERMENTATIVE PRODUCTION OF L-THREONINE
 3582471 - METHOD OF PRODUCING THREONINE BY FERMENTATION
 3616218 - METHOD OF PRODUCING L-LYSINE
 3616224 - PRODUCTION OF AMINO ACIDS BY FERMENTATION
 3623952 - METHOD OF PRODUCING L-SERINE BY FERMENTATION
 3660235 - METHOD FOR PRODUCING PHENYLALANINE BY FERMENTATION
 3663370 - PROCESS FOR PRODUCING L-GLUTAMIC ACID BY FERMENTATION
 3674639 - METHOD OF PRODUCING L-GLUTAMIC ACID BY FERMENTATION
 3700559 - METHOD OF PRODUCING TRYPTOPHAN BY FERMENTATION
 3704205 - METHOD OF PRODUCING L-GLUTAMIC ACID BY FERMENTATION
 3707441 - METHOD OF PRODUCING L-LYSINE BY FERMENTATION
 3709785 - METHOD OF PRODUCING L-THREONINE BY FERMENTATION
 3715429 - METHOD OF PRODUCING L-GLUTAMIC ACID BY FERMENTATION
 3757529 - METHOD OF PRODUCING L-ARGININE BY MICROORGANISM
 3784426 - METHOD OF PRODUCING L-ISOLEUCINE BY FERMENTATION
 3791924 - BIOLOGICAL METHOD OF PRODUCING L-GLUTAMIC ACID BY FERMENTATION OF AROMATIC ORGANIC COMPOUNDS
 3801456 - METHOD FOR PRODUCING L-ARGININE BY FERMENTATION
 3808101 - BIOLOGICAL METHOD OF PRODUCING TRYPTOPHAN AND 5-SUBSTITUTED TRYPTOPHANS
 3819483 - METHOD OF PRODUCING L-PROLINE BY FERMENTATION
 3825472 - METHOD OF PRODUCING L-LYSINE BY FERMENTATION
 3833473 - METHOD FOR PRODUCING L-ARGININE BY FERMENTATION
 3841966 - METHOD OF PREPARING AN OPTICALLY ACTIVE AMINO ACID FOR A SALT OF AN ACYL DERIVATIVE THEREOF IN THE RACEMIC FORM
 3843441 - METHOD OF PRODUCING L-SERINE BY FERMENTATION
 3855690 - FERMENTATIVE PRODUCTION OF L-LEUCINE AND SERINOL DERIVATIVES
 3871958 - BIOLOGICAL METHOD OF PRODUCING L-SERINE AND SERINOL DERIVATIVES
 3873960 - FERMENTATIVE PRODUCTION OF L-LEUCINE BY FERMENTATION
 3878044 - FERMENTATIVE PRODUCTION OF L-HISTIDINE
 3878044 - METHOD OF PRODUCING L-ARGININE BY FERMENTATION
 3880718 - METHOD FOR LIMITING DAMAGE DUE TO BACTERIOPHAGES IN FERMENTATION MEDIA
 3880741 - METHOD OF PRODUCING L-SERINE
 3886039 - METHOD FOR PRODUCING L-GLUTAMINE
 3893888 - FERMENTATIVE PRODUCTION OF L-VALINE
 3907638 - SELECTIVE DEACYLATION OF N-ACYL-OL-AMINO ACIDS
 3909353 - METHOD OF PRODUCING L-PHENYLALANINE BY FERMENTATION
 3929571 - PROCESS FOR PREPARING L-LYSINE
 3929573 - METHOD OF PREPARING L-TRYPTOPHAN
 3942038 - METHOD FOR PRODUCING AMINO ACIDS BY CULTURING HYDROGEN-OXIDIZING BACTERIA
 3970519 - PROCESS FOR PRODUCING L-LEUCINE
 3971701 - METHOD FOR PRODUCING L-GLUTAMIC ACID BY FERMENTATION
 4000649 - METHOD FOR PRODUCING L-LEUCINE AND L-VALINE
 4000649 - METHOD OF PRODUCING L-CYSTEINE AND L-CYSTEINE
 4016037 - METHOD FOR PRODUCING L-AMINO ACID
 4066501 - METHOD FOR PRODUCING L-LYSINE BY FERMENTATION

AMINO ACIDS

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

AUNOMOTO COMPANY INCORPORATED (CONTINUED)

- 4065502 - METHOD OF PRODUCING CARBON SOURCE FOR FERMENTATION OF L-TRYPTOPHAN
- 4071405 - METHOD FOR PRODUCING L-TRYPTOPHAN
- 4111403 - METHOD FOR PRODUCING L-TRYPTOPHAN
- 4211840 - METHOD FOR PRODUCING L-TRYPTOPHAN
- 4224409 - METHOD FOR PRODUCING L-PROLINE BY FERMENTATION
- 4275157 - METHOD FOR THE PRODUCTION OF L-LYSINE

AKTIEBOLAGET BOFORS

- 3915796 - FERMENTATIVE PREPARATION OF TRYPTOPHAN DERIVATIVES
- 3963572 - FERMENTATIVE PROCESS FOR THE PRODUCTION OF L-TRYPTOPHAN AND ITS DERIVATIVES

AMERICAN CYANAMID COMPANY

- 4197245 - 1-HYDROXYMETHYL-1-OXO-PROSTANE DERIVATIVES OF THE A-HO 1-B SERIES

AMERICAN HOME PRODUCTS CORPORATION

- 3455783 - CONTROL OF ENZYME ACTIVITY IN NONFLUID GELS
- 3455784 - CONTROL OF ENZYME ACTIVITY IN FROZEN SYSTEMS
- 3488258 - METHOD OF RESOLVING RACEMIC STERIODS

ASAH KASEI KOGYO KABUSHIKI KAISHA

- 3616214 - CULTURE OF MICROORGANISMS ON HYDROCARBONS
- 3730837 - PROCESS FOR PRODUCING YEAST WITH INCREASED METHIONINE CONTENT
- 3915795 - PROCESS FOR PRODUCING L-5-METHOXYTRYPTOPHAN USING MICROORGANISMS

ASTRA LAKEMEDEL AKTIEBOLAG

- 3838008 - STEREODSELECTIVE PREPARATION OF L-DOPA AND L-N-TYROSINE AND NOVEL COMPOUNDS

BAXTER TRAVENOL LABORATORIES, INC.

- 4288538 - TEST METHOD AND COMPOSITION THEREFOR

BAYER AKTIENGESellschaft

- 4260684 - STEREODSELECTIVE RESOLUTION OF PHENYLGLYCINE DERIVATIVES AND 4-HYDROXYPHENYLGLYCINE DERIVATIVES WITH ENZYME RESINS

BECKMAN INSTRUMENTS INC.

- 4205183 - FACILE METHOD FOR ISOLATING RESOLVED AMINO ACIDS

BOEHRINGER INGELHEIM GMBH

- 3855082 - PROCESS FOR PREPARATION OF DERIVATIVES OF L-TYROSINE

BOEHRINGER MANNHEIM G.M.B.H.

- 3639211 - PROCESS FOR THE PREPARATION OF CREATINE PHOSPHATE

BRISTOL-MYERS COMPANY

- 3823069 - PREPARATION OF L(-)-GAMMA-AMINO-ALPHA-HYDROXYBUTYRIC ACID

CANADIAN PATENTS AND DEVELOPMENT LIMITED

- 3813317 - RESOLUTION OF RACEMATES OF RING-SUBSTITUTED PHENYLALANINES

CHUGAI SEIYAKU KABUSHIKI KAISHA

- 3668072 - FERMENTATION PROCESS FOR THE PRODUCTION OF L-ORNITHINE

COMMERCIAL SOLVENTS CORPORATION

- 3428525 - PRODUCTION OF O-CARBAMYL-O-SERINE
- 3429776 - PROCESS FOR THE PRODUCTION OF GLUTAMIC ACID
- 3451891 - PROCESS FOR THE PRODUCTION OF GLUTAMIC ACID

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

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- COMMERCIAL SOLVENTS CORPORATION
 3627637 - PRODUCTION OF ORGANIC NITROGENOUS MATERIALS
 3929575 - METHOD OF PRODUCING GLUTAMIC ACID BY FERMENTATION
- COUTLER ELECTRONICS INC.
 4087331 - COLORIMETRIC METHOD FOR DETERMINING GAMMA-GLUTAMYL TRANSEPTIDASE AND COMPOSITIONS USEFUL THEREIN
- CPC INTERNATIONAL INC.
 4276379 - PREPARATION OF HIGH FRUCTOSE SYRUPS FROM SUCROSE
- CROWN ZELLERBACH CORPORATION
 3558434 - STIMULATION OF THE GROWTH OF MICROORGANISMS
- DEGUSA AKTIENGESSELLSCHAFT
 4304858 - PROCESS FOR THE CONTINUOUS ENZYMIC CHANGE OF WATER SOLUBLE +60 -KETOCARBOXYLIC ACIDS INTO THE CORRESPONDING AMINO ACID
- DENKI KAGAKU KOGYO KABUSHIKI KAISHA
 3915797 - IMMOBILIZED ENZYMES
- DYNAMIT NOBEL AKTIENGESSELLSCHAFT
 4271269 - REGENERATION OF AN ENZYME IMMOBILIZATE
- EISAI CO., LTD.
 4022664 - PROCESS FOR BIOCHEMICAL OPTICAL RESOLUTION OF ALPHA-TOCOPHERAL
- ETHYL CORPORATION
 4259441 - PROCESS FOR RESOLVING D, L-LEUCINE
 4262092 - PROCESS FOR PRODUCING N-ACYL-O-PHENYLALANINE ESTER
- EXXON RESEARCH + ENGINEERING CO.
 3440141 - PRODUCTION OF AMINO ACIDS BY THE FERMENTATION OF C/15\ -C/22\ OLEFINS
 3562110 - PRODUCTION OF AMINO ACIDS
- FIRMA CARL FREUENBERG
 4232123 - METHOD FOR MAKING WATER-SOLUBLE HYDROLYZATES OF KERATINACEOUS MATERIALS
- GESELLSCHAFT FÜR BIOTECHNOLOGISCHE FORSCHUNG MBH
 4060455 - PROCESS FOR THE MICROBIAL PRODUCTION OF L-SERINE USING PSEUDOMONAS SP. DSM 672
- GRUPPO LEPEITI S. P. A.
 3700558 - PRODUCTION OF L-TRYPTOPHAN BY FERMENTATION
- GULF RESEARCH AND DEVELOPMENT COMPANY
 3713984 - CULTIVATION OF MICRO-ORGANISMS ON HYDROCARBONS
- HOFFMANN-LA ROCHE INC.
 3775255 - L-TRANS-2-AMINO-4-(2-AMINOETHOXY)-3-BUTENOIC ACID
 3859171 - L-2-AMINO-4-M ETHOXY-TRANS-3-BUTENOIC ACID
 3865694 - FERMENTATIVE PREPARATION OF L-2-AMINO-4-(2-AMINOETHOXY)-BUTANOIC ACID
 3901880 - (S)-ALANYL-3-[ALPHA-(S)-CHLORO-3-(S)-HYDROXY-2-OXO-AZETIDINYL METHYL]-(S)-ALANINE
 4061542 - 2-METHYL-L-ARGININE PRODUCED BY CULTIVATING STREPTOMYCES STRAIN
 4202943 - RESOLUTION OF A RACEMATE
 4204044 - PROCESS FOR THE MANUFACTURE OF OPTICALLY ACTIVE +60 -HYDROXYCARBOXYLIC ACIDS

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

IMPERIAL CHEMICAL INDUSTRIES LIMITED
 3892628 - PROCESS FOR GROWING A FUNGUS
 4035468 - POLYPEPTIDES
 4183787 - CIRCULATION OF GAS/LIQUID MIXTURES

INSTITUTE OF GAS TECHNOLOGY
 3649459 - MICROBIOLOGICAL OXIDATION OF HYDROCARBONS

INSTITUT FRANCAIS DU PETROLE
 3986933 - METHOD OF PREPARING YEASTS ENRICHED IN L-LYSINE AND CAPABLE OF EXCRETING ORGANIC ACIDS

KANEGAFUCHI KAGAKU KOGYO KABUSHIKI KAISHA
 3759789 - PROCESS FOR THE MICROBIAL PRODUCTION OF LYSINE AND ISOLEUCINE
 3889737 - PROCESS FOR PRODUCING L-LYSINE USING MIXED MICROORGANISMS
 3920598 - PROCESS FOR PRODUCTION OF L-LYSINE BY FERMENTATION
 3920520 - FERMENTATION PROCESS FOR PRODUCING OPTICALLY ACTIVE L-LYSINE
 4094741 - PROCESS FOR PREPARING D-(-)-N-CARBAMOYL-2-(PHENYL OR SUBSTITUTED PHENYL)GLYCINES
 4123329 - PROCESS FOR PRODUCING L-LYSINE BY FERMENTATION
 4123328 - PROCESS FOR PRODUCING L-METHIONINE
 4148688 - PROCESS FOR PREPARING D-N-CARBAMOYL-+60 -AMINO ACIDS
 4237227 - PROCESS FOR PREPARING D-N-CARBAMOYL-+60 -AMINO ACIDS
 4242452 - PROCESS FOR PREPARING D-N-CARBAMOYL-D-THIENYLGLYCINES

KIKKOMAN SHOYU CO., LTD.

3912822 - PROCESS FOR PRODUCING A PROTEIN HYDROLYSATE

KYOMA HAKKO KOGYO CO., LTD.

3420744 - PROCESS FOR PRODUCING L-GLUTAMINE
 3420745 - PROCESS FOR PRODUCING L-GLUTAMIC ACID
 3420598 - PROCESS FOR PRODUCING L-GLUTAMINE ACID AND ALPHA-KETOGLUTARIC ACID
 3434830 - PROCESS FOR PRODUCING L-THREONINE
 3494831 - PROCESS FOR PRODUCING L-LYSINE FROM 5-(4-AMINO)BUTYL-HYDANTOIN
 3511752 - METHOD FOR PRODUCING L-GLUTAMIC ACID
 3523801 - PROCESS FOR THE PREPARATION OF SEASONINGS
 3531372 - PROCESS OF PRODUCING DIAMINOPIMELIC ACID
 3574061 - PROCESS FOR PREPARING L-ORNITHINE BY FERMENTATION
 3591456 - PROCESS FOR PRODUCING L-TRYPTOPHAN
 3594279 - PROCESS FOR PRODUCING L-TRYPTOPHAN
 3595751 - PROCESS FOR PRODUCING L-LYSINE
 3598701 - PROCESS FOR PRODUCING L-HOMOSERINE
 3598700 - PROCESS FOR PRODUCING L-HOMOSERINE
 3598700 - PROCESS FOR PRODUCING L-THREONINE
 3598700 - PROCESS FOR PRODUCING L-THREONINE
 3630843 - PROCESS FOR TREATING A HYDROCARBON FERMENTATION LIQUOR
 3639210 - FERMENTATION PROCESSES UTILIZING GASEOUS HYDROCARBONS
 3642576 - PROCESS FOR PRODUCING L-GLUTAMIC ACID AND ALPHA-KETOGLUTARIC ACID
 3642579 - PROCESS FOR PRODUCING L-PROLINE
 3647628 - PROCESS FOR PRODUCING L-PROLINE
 3650899 - PROCESS FOR PRODUCING L-THREONINE
 3654079 - PROCESS FOR PRODUCING L-PHENYLALANINE BY FERMENTATION
 3655510 - PROCESS FOR PREPARING AMINO ACIDS FROM HYDROCARBONS
 3668073 - PREPARATION OF L-LEUCINE BY FERMENTATION
 3671396 - PROCESS FOR PRODUCING L-HISTIDINE
 3676301 - PROCESS FOR PRODUCING L-HISTIDINE
 3684554 - PROCESS FOR PRODUCING L-THREONINE
 3684555 - PROCESS FOR PRODUCING N-ACETYLGLUTAMINE
 3687809 - PROCESS FOR PRODUCING L-LYSINE FROM L-ASPARTIC ACID

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

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- KYOWA HAKKO KOGYO CO., LTD.
- 3687810 - PROCESS FOR PRODUCING L-LYSINE BY FERMENTATION
 - 3689360 - PROCESS FOR PRODUCING ALPHA-(N-ACETYL)-L-ORNITHINE
 - 3692628 - PROCESS FOR PRODUCING L-SERINE
 - 3698997 - PREPARATION OF L-TYROSINE BY FERMENTATION
 - 3700556 - PROCESS FOR PRODUCING L-VALINE
 - 3700557 - PROCESS FOR PRODUCING L-LYSINE BY FERMENTATION
 - 3708395 - PROCESS FOR PRODUCING L-LYSINE
 - 3711373 - PROCESS FOR PRODUCING L-GLUTAMIC ACID
 - 3711374 - PROCESS FOR PRODUCING L-LYSINE BY FERMENTATION IN THE PRESENCE OF HYDROCARBONS
 - 3711375 - PROCESS FOR PRODUCING L-THREONINE
 - 3713977 - PROCESS FOR PRODUCING L-HISTIDINE
 - 3720561 - PROCESS FOR PRODUCING L-THREONINE
 - 3720561 - PROCESS FOR PRODUCING DIMETHIONINE
 - 3723144 - PROCESS FOR PRODUCING L-METHIONINE
 - 3723144 - PROCESS FOR PRODUCING L-THREONINE AND L-LYSINE
 - 3755081 - PROCESS FOR PREPARING L-SERINE
 - 3759790 - PROCESS FOR PREPARING L-PHENYLALANINE
 - 3764473 - PROCESS FOR PRODUCING L-GLUTAMIC ACID
 - 3787287 - PROCESS FOR THE PRODUCTION OF L-TYROSINE
 - 3791925 - PROCESS FOR PRODUCING L-HISTIDINE
 - 3795583 - PROCESS FOR PREPARING L-SERINE
 - 3816258 - PROCESS FOR PRODUCING L-HISTIDINE BY FERMENTATION
 - 3839151 - PROCESS FOR PRODUCING L-LYSINE BY FERMENTATION
 - 3849250 - PROCESS FOR PRODUCING L-ARGININE BY FERMENTATION
 - 3849251 - PROCESS FOR PRODUCING L-TRYPTOPHAN
 - 3907637 - PROCESS FOR PRODUCING L-GLUTAMIC ACID
 - 3917511 - PROCESS FOR PRODUCING AMINO ACIDS BY FERMENTATION
 - 3917511 - PROCESS FOR PREPARING L-PHENYLALANINE
 - 3939042 - PROCESS FOR THE PRODUCTION OF L-GLUTAMIC ACID
 - 3959075 - PROCESS FOR THE PRODUCTION OF L-LYSINE
 - 4086137 - PROCESS FOR THE PRODUCTION OF L-ARGININE BY FERMENTATION
 - 4169763 - PROCESS FOR THE PRODUCTION OF L-LYSINE BY FERMENTATION
 - 4183786 - PROCESS FOR THE PRODUCTION OF L-SERINE
 - 4302540 - PROCESS OF PRODUCING OPTICALLY ACTIVE CEPHALOSPORIN ANALOGS BY ENZYME SELECTIVE DEACYLATION
 - 4302541 - PROCESS OF PRODUCING OPTICALLY ACTIVE CEPHALOSPORIN ANALOGS BY ENZYME SELECTIVE DEACYLATION

LES PRODUITS ORGANIQUES OU SENTERRE ORSAN

393586 - METHOD OF MAKING L-ASPARTIC ACID FROM FUMARIC ACID

LIQUICHIMICA S.p.A.

4013508 - PROCESS FOR THE PRODUCTION OF 1-ASPARTIC ACID BY FERMENTATION OF HYDROCARBONS

LOUISIANA STATE UNIVERSITY FOUNDATION

4278766 - MUTANT MICROORGANISMS USEFUL FOR THE PRODUCTION OF SINGLE CELL PROTEIN AND AMINO ACIDS

LOUISIANA STATE UNIVERSITY FOUNDATION

4104124 - PROCESS FOR THE PRODUCTION OF SINGLE CELL PROTEIN AND AMINO ACIDS

MEIJI SETKA KAISHA LTD.

4226941 - PROCESS FOR THE OPTICAL RESOLUTION OF D,L-2-AMINO-4-METHYLPHOSPHINOBUTYRIC ACID

MERCK & CO., INC.

382497 - LYSINE PRODUCTION

392578 - ENANTIOSELECTIVE RESOLUTION OF RACEMIC (CIS-1,2-EPOXYPROPYL) PHOSPHONIC ACID COMPOUNDS

3929576 - PRODUCING 3-FLUORO-D-ALANINE

AMINO ACIDS

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

MITSUBISHI CHEMICAL INDUSTRIES LTD.

3974031 - PROCESS FOR PRODUCING L-CYSTEINE OR ITS DERIVATIVES

MITSUBISHI GAS-CHEMICAL COMPANY, INC.

4092220 - PROCESS FOR MANUFACTURE OF L-(+)-TARTARIC ACID OR SALTS THEREOF

MITSUBISHI PETROCHEMICAL CO., LTD.

4271267 - PREPARATION OF L-TRYPTOPHAN BY FERMENTATION

4276380 - PRODUCTION OF L-AMINO ACIDS

MITSUI TOATSU CHEMICALS, INC.

3905867 - METHOD OF PRODUCING L-LYSINE BY FERMENTATION

MOBIL OIL CORPORATION

3756916 - METHOD OF ISOLATING AMINO ACID PRODUCING MUTANT MICROORGANISMS AND MUTANTS OBTAINED THEREFROM

MONSANTO COMPANY

3649457 - ENZYMATIC PROCESSING WITH POLYMER-ENZYME PRODUCT

NALCO CHEMICAL COMPANY

3591455 - CONTINUOUS MICROBIAL PROCESS

NISSEIN FLOUR MILLING CO., LTD.

3767528 - PROCESS FOR THE MANUFACTURE OF 3,4-DISUBSTITUTED PHENYL-L-ALANINES

NODA INSTITUTE FOR SCIENTIFIC RESEARCH

3502544 - PROCESS FOR PRODUCING L-ISOLEUCINE BY FERMENTATION

NOVO INDUSTRI A/S

4080259 - PROCESS OF PREPARING L AND D ALPHA-AMINO ACIDS BY ENZYME TREATMENT OF DL-ALPHA-AMINO ACID AMIDE

OMENS-ILLINOIS INC.

3812009 - STEREOSPECIFIC PROCESS FOR THE PREPARATION OF L-3,4-OIHYDROXY-PHENYLALANINE (L-DOPA) AND ANALOGS THEREOF

PARKE DAVIS & COMPANY

3669837 - PROCESS FOR PRODUCING 3-(3,4-DIMETHOXYPHENYL)-L-ALANINE BY ENZYMATIC RESOLUTION

PHILLIPS PETROLEUM COMPANY

3642578 - MICROBIAL SYNTHESIS FROM ALDEHYDE CONTAINING HYDROCARBON DERIVED PRODUCTS

3856774 - MICROBIAL SYNTHESIS FROM ALDEHYDE CONTAINING HYDROCARBON DERIVED PRODUCTS

PROCTER & GAMBLE COMPANY

3963573 - PROCESS FOR PRODUCING N-ACYL-L-METHIONINE

RESEARCH PRODUCTS REHOVOT LTD.

4251631 - CROSS-LINKED ENZYME MEMBRANE

RESEARCH TRIANGLE INSTITUTE

4087328 - PURIFICATION AND IMMOBILIZATION OF SULPHYORYL OXIDASE

RHONE POULENC INDUSTRIES

4132596 - SUPPORT-AMINOCYLASE COMPLEXES

4189349 - +60, +67 -OLAMINOACID AND ITS LACTAM

RHONE-POULENC S.A.

3703439 - PROCESS FOR THE PREPARATION OF L-BETA-(3, 4-OIHYDROXYPHENYL)-ALPHA-ALANINE BY FERMENTATION

ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

SANRAKU-OCEAN CO., LTD.

3563857 - PROCESS FOR PRODUCING L-GLUTAMIC ACID BY FERMENTATION

SCHERING AKTIENGESSELLSCHAFT

3830696 - PROCESS FOR THE PREPARATION OF 5-HYDROXY-L-TRYPTOPHAN

SCHERING CORPORATION

4232006 - ANTIBIOTIC W-10 COMPLEX, ANTIBIOTIC 20561 AND ANTIBIOTIC 20562 AS ANTIFUNGAL AGENTS

SMITHKLINE CORPORATION

4233546 - ANTHRACYCLINE ANTIBIOTICS PRODUCED BY +1 STREPTOSPORANGIUM FRAGILIS +B SHEARER SP. NOV. ATCC 31519

SNAM PROGETTI S.P.A.

3964970 - PROCESS FOR THE PREPARATION OF L-CAR-BANYL-AMINO ACIDS AND OF THE CORRESPONDING L-AMINO ACIDS

4065353 - METHOD FOR THE PREPARATION OF O-CARBAMYL AMINOACIDS AND THE CORRESPONDING O-AMINOACIDS

4111749 - METHOD OF CONVERTING RACEMIC HYDANTOINS INTO OPTICALLY ACTIVE AMINOACIDS

4248967 - ENZYMIC COMPLEXES ADAPTED TO CONVERT RACEMIC HYDANTOINS INTO OPTICALLY ACTIVE AMINOACIDS, AND THEIR APPLICATIONS

SOUTHERN ILLINOIS UNIVERSITY FOUNDATION

3878043 - METHOD FOR PREPARING L-DOPA AND NOVELS COMPOUNDS USEFUL THEREIN

STAMICARBON B.V.

3971700 - PROCESS FOR THE ENZYMATIC RESOLUTION OF OL-PHENYL GLYCINE AMIDE INTO ITS OPTICALLY ACTIVE ANTIPODES

SUMITOMO CHEMICAL COMPANY, LIMITED

4108723 - METHOD FOR OPTICAL RESOLUTION OF OL-LYSINE COMPOUNDS

TAKASAGO PERFUMERY COMPANY LIMITED

3607651 - METHOD FOR THE BIOCHEMICAL ISOLATION OF ALPHA-MENTHOL

TAKEDA CHEMICAL INDUSTRIES LTD.

3603372 - TOTAL SYNTHESIS OF 13-HYDROCARBON- SUBSTITUTED GONAPOLYENES

3603371 - METHOD FOR PRODUCING O-PANTIC ACID

3623951 - METHOD FOR PRODUCING L-GLUTAMIC ACID

3654078 - METHOD FOR PRODUCING L-GLUTAMIC ACID

3709787 - PRODUCING L-GLUTAMIC ACID

3801457 - METHOD FOR PRODUCING L-TRYPTOPHAN

4011135 - PRODUCTION OF L(+)-TARTARIC ACID

TANABE SEIYAKU CO. LTD.

3498400 - PROCESS FOR PRODUCING L-ALANINE

3730838 - ENZYMATIC PREPARATION OF L-CITRULLINE

3734829 - FERMENTATIVE PREPARATION OF L-ARGININE

3816356 - OPTICAL RESOLUTION OF RACEMIC AMINO ACIDS

3841968 - FERMENTATIVE PREPARATION OF L-ISOLEUCINE

3871959 - FERMENTATIVE PRODUCTION OF L-ALANINE

3886040 - NOVEL PROCESS FOR PREPARING L-CITRULLINE

3898128 - PROCESS FOR PREPARING L-ALANINE

3902966 - FERMENTATIVE PREPARATION OF L-HISTIDINE

4090319 - PROCESS FOR PRODUCING L-ARGININE BY FERMENTATION

4224411 - WATER-INSOLUBLE TANNIN PREPARATION FOR IMMOBILIZATION OF PROTEINS

3770585 - PROCESS FOR PREPARING 1-LYSINE

TODAY INDUSTRIES INC.

3770585 - PROCESS FOR PREPARING 1-LYSINE

AMINO ACIDS

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ORGANIZATIONAL PATENTING (1/69-12/81) - - ALPHA LISTING

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TORAY INDUSTRIES INC.
3796632 - PROCESS FOR RACEMIZING ALPHA-AMINO-EPSILON-CAPROLACTAM

UNIVERSITY OF CALIFORNIA, THE REGENTS OF
3817830 - METHOD FOR OBTAINING OPTICALLY ACTIVE COMPOSITION FROM RACEMATE OF VANILLYLMANDELIC ACID

UNIVERSITY OF EDINBURGH
3875004 - ENZYMATIC PROCESS FOR PRODUCING PROSTAGLANDINS C

UPJOHN COMPANY

3753859 - MICROBIOLOGICAL PROCESS FOR PREPARING THE AMINO ACIDS TRANS-4-N PROPYL-L-PROLINE AND TRANS-4-ETHYL-L-PROLINE
4029548 - PROCESS FOR PRODUCING ANTIBIOTICS U-50,147 AND U-51,738

WISCONSIN ALUMNI RESEARCH FOUNDATION
3671397 - METHOD FOR PREPARING L-OPA

ZAIDAN HOJIN BISEIBUTSU KAGAKU KENKYU KAI
4029547 - BIOLOGICALLY ACTIVE SUBSTANCE, BESTATIN, AND PRODUCTION THEREOF

INVENTORS OF INDIVIDUALLY OWNED PATENTS (1/75-12/81) (ALPHA LISTING)

INVENTOR NAME	STREET	CITY	ST	ZIP/CNTRY
BALITSKAYA 4054489 - METHOD OF PREPARING L-GLUTAMIC ACID AND ITS SODIUM SALT	ROZA ULITSA VYBORGSKAYA, 4, KV. 6	MOSCOW		SU
BEKER 4286060 - PROCESS FOR PRODUCTION OF AN AMINO ACID	MARTIN E. ZVEVAS, 4	RIGA		SU
BUKIN 4286060 - PROCESS FOR PRODUCTION OF AN AMINO ACID	VASILY N. LENINSKY PROSPEKT, 13, KORPUS	MOSCOW		SU
CHARLES 4048018 - METHOD OF CARRYING OUT ENZYME CATALYZED REACTIONS	MARVIN 622 N. 29 ST.	ALLENTOWN	PA	18104
COUGHLIN 4048018 - METHOD OF CARRYING OUT ENZYME CATALYZED REACTIONS	ROBERT W. 902 SEVENTH AVE.	BETHLEHEM	PA	18018
DEBABOV 4278765 - METHOD FOR PREPARING STRAINS WHICH PRODUCE AMINOACIDS	VLADIMIR G. ULITSA MIKLUKHO-MAKLAYA, 43, K	MOSCOW		SU
OWITRENKO 4286060 - PROCESS FOR PRODUCTION OF AN AMINO ACID	LEONTO V. PROSPEKT MORISA TOREZA, 9, KV.	LENINGRAD		SU
ENGELBART 3880716 - PROCESS FOR MAKING OPTIMUM CHEMICAL CONVERSIONS AND BIOLOGICAL FERMENTATIONS	FRITZ HANNOVERSCHE STR. 62	ANDERTEN UB. HANNOVE		DT
ENGELBART 3880716 - PROCESS FOR MAKING OPTIMUM CHEMICAL CONVERSIONS AND BIOLOGICAL FERMENTATIONS	WILKE WARENBURGSTR. 40	OLDENBURG		DT
EVSTUGOV-BABAEV 4054489 - METHOD OF PREPARING L-GLUTAMIC ACID AND ITS SODIUM SALT	LEV MIKHAILOV ULITSA PUSHKINA, 22, KV. 36	MOSCOW		SU
GLUSCHENKO 4286060 - PROCESS FOR PRODUCTION OF AN AMINO ACID	NINA V. GRAZHOANSKY PROSPEKT, 31, KORP	LENINGRAD		SU
KASATKINA 4054489 - METHOD OF PREPARING L-GLUTAMIC ACID AND ITS SODIUM SALT	TATYANA BORISOVNA PROSPEKT MIRA, 120, KV. 226	MOSCOW		SU
KHURGES 4278765 - METHOD FOR PREPARING STRAINS WHICH PRODUCE AMINOACIDS	EVGENY M. ULITSA TIKHVINSKAYA, 1/13, KV.	MOSCOW		SU
KOZLOV 4278765 - METHOD FOR PREPARING STRAINS WHICH PRODUCE AMINOACIDS	JURY I. MIKROKALON 2, KORPUS 3, KV. 17	MOSCOW		SU
KOZYREVA 4237228 - METHOD OF PRODUCING L-ISOLEUCINE USING +I BREVI BACTERIUM FLAVUM	LJUDMILA F. 4 NOVODOMOSKOVNY PEREULOK, 4,	MOSCOW		SU
KUTSEVA 4286060 - PROCESS FOR PRODUCTION OF AN AMINO ACID	LIDIA S. MOSKOVSKAYA OBLAST, ULITSA SVO	MALAKHOVKA		SU
KUZMINA 4286060 - PROCESS FOR PRODUCTION OF AN AMINO ACID	MARIYA A. LENINGRADSKAYA OBLAST, ULITS	SESTRORETSK		SU
KUZNETSOVA 4054489 - METHOD OF PREPARING L-GLUTAMIC ACID AND ITS SODIUM SALT	NATALYA NIKOLAEVNA ULITSA ONEPROPETROVSKAYA, 23,	MOSCOW		SU

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FRONT PAGES OF SELECTED PATENTS

<u>Jan-Apr 1982</u> <u>U.S. Patents (4)</u>	<u>Selected</u> <u>U.S. Patents (40)</u>	
4,309,342	4,211,840	4,262,092
4,326,029	4,016,037	4,248,967
4,312,948	3,915,795	4,132,596
4,321,325	3,963,572	4,259,441
	4,148,688	4,237,228
	4,071,405	4,061,542
	4,006,057	4,226,941
	3,963,573	4,086,137
	4,104,124	4,204,044
	4,066,502	4,080,259
	3,986,933	4,224,409
	4,054,489	3,964,970
	4,276,380	4,271,269
	4,169,763	4,242,452
	4,275,157	4,237,227
	4,108,723	4,224,411
	4,183,786	4,202,943
	4,060,455	4,251,631
	3,970,519	4,184,918
	4,260,684	3,971,701

PATENTS ARE LISTED IN ORDER OF APPEARANCE

United States Patent

[11] 4,276,380
[45] Jun. 30, 1981

Yukawa et al.

- [56] **PRODUCTION OF L-AMINO ACIDS**
[75] **Inventors:** Hideoaki Yukawa; Kanako Onumi; Kazuo Kikuchi; Shirohiko Takayama, all of Aomi, Japan
[73] **Assignee:** Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan
[21] **Appl. No.:** 120,063
[22] **Filed:** Feb. 13, 1980
[30] **Foreign Application Priority Data**
Feb. 13, 1979 [JP] Japan 54-15341
May 18, 1979 [JP] Japan 54-61109
[51] **Int. Cl.:** C12P 13/08
[52] **U.S. Cl.:** 435/115; 435/247; 435/252; 435/253
[58] **Field of Search:** 435/115; 435/121; 435/122; 435/115

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3,097,461 9/1975 Nakamura et al. 435/115 X
3,920,320 11/1975 Tsuka et al. 435/115
Primary Examiner—Lionel M. Shapiro
Attorney, Agent, or Firm—Sughrue, Rothwell, Mion, Zinn and Macpeak
[57] **ABSTRACT**
A process for producing L-valine or L-lysine which comprises aerobically culturing a bacterium belonging to the genus *Corynebacterium* and which utilizes L-valine or L-lysine, in a culture medium in which ethanol is the main carbon source to produce and accumulate L-valine and/or L-lysine and collecting.

3 Claims, No Drawings

United States Patent

[11] 4,275,157
[45] Jun. 23, 1981

Tosaka et al.

- [54] **METHOD FOR THE PRODUCTION OF L-LYSINE**
[73] **Inventors:** Osamu Tsuka; Tokyo; Eiji Ono; Kawasaki; Masaru Ishihara; Yokohama; Hideo Morioka; Masaharu Iwano; Yokohama; all of Japan
[73] **Assignee:** Ajinomoto Company, Incorporated, Tokyo, Japan
[21] **Appl. No.:** 86,414
[22] **Filed:** Jul. 10, 1979
[30] **Foreign Application Priority Data**
Jul. 10, 1978 [JP] Japan 53-83007
[51] **Int. Cl.:** C12P 13/08

- [52] **U.S. Cl.:** 435/115; 435/172; 435/180; 435/183; 435/184; 435/185
[56] **Field of Search:** 435/115; 435/172; 435/180; 435/183; 435/184; 435/185
Reference Cited
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3,756,916 9/1973 Levitt 435/115
3,871,960 3/1975 Kabata et al. 435/115
Primary Examiner—Alvin E. Tuenholz
Attorney, Agent, or Firm—Olson, Palmer, Spivak, McMillan & Mear
[57] **ABSTRACT**
L-lysine is produced by culturing mutants of *Corynebacterium* or *Brevibacterium* which are sensitive to fluoropyruvic acid.

4 Claims, No Drawings

United States Patent

[11] 4,169,763
[45] Oct. 2, 1979

Nakayama et al.

- [56] **PROCESS FOR THE PRODUCTION OF L-LYSINE BY FERMENTATION**
[73] **Inventors:** Kiyoshi Nakayama; Sugiyama; Akio Araki; Yoshinaka Tanaka, both of Mochida, all of Japan
[73] **Assignee:** Kyowa Hakko Kogyo Co., Ltd., Japan
[21] **Appl. No.:** 814,621
[22] **Filed:** Jan. 11, 1977
[30] **Foreign Application Priority Data**
Jan. 9, 1976 [JP] Japan 51-81016
[51] **Int. Cl.:** C12D 13/06
[52] **U.S. Cl.:** 435/115; 435/247; 435/252; 435/253
[58] **Field of Search:** 435/115; 435/247

- References Cited**
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3,079,410 6/1964 Yoshida et al. 195/47
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3,900,865 9/1975 Kurimura et al. 195/29 R
4,059,855 11/1976 Tanaka et al. 195/29 R
4,150,501 1/1979 Tanaka et al. 195/29
Primary Examiner—Lionel M. Shapiro
Attorney, Agent, or Firm—Craig and Antonelli
[57] **ABSTRACT**
A process for producing L-lysine by fermentation includes the steps of culturing a strain belonging to the genus *Corynebacterium* having both an ability to produce L-lysine and a resistance to at least one member of the group consisting of fluoropyruvic acid, 2-oxoglutaric acid and sulfuric acid in a nutrient medium, forming and accumulating L-lysine in the resulting culture liquor and thereafter recovering the L-lysine therefrom.

6 Claims, No Drawings

United States Patent

[11] 4,108,723
[45] Aug. 22, 1978

Hirohara et al.

- [54] **METHOD FOR OPTICAL RESOLUTION OF DL-LYSINE COMPOUNDS**
[73] **Inventors:** Hideo Hirohara; Shigeo Tanemaki; Nagasaki; Tameyuki Nagase; Takatsuki, all of Japan
[73] **Assignee:** Sumitomo Chemical Company, Limited, Osaka, Japan
[21] **Appl. No.:** 829,945
[22] **Filed:** Sep. 1, 1977
[30] **Foreign Application Priority Data**
Sep. 4, 1976 [JP] Japan 51-00277
[51] **Int. Cl.:** C09B 19/02
[52] **U.S. Cl.:** 195/29; 195/20; 195/DIG. 11
[58] **Field of Search:** 195/29; 195/20; 195/29

- [56] **Reference Cited**
U.S. PATENT DOCUMENTS
3,816,524 6/1974 Sadler 195/2
3,863,573 6/1976 Sadler 195/2
Primary Examiner—Alvin Tuenholz
Attorney, Agent, or Firm—Cushman, Darby & Cushman
[57] **ABSTRACT**
A method for optical resolution of DL-lysine alkyl ester or acid-addition salts thereof by contacting an aqueous solution of the ester or salts thereof with a non-aqueous solution of an optically active compound, e.g., *S*-lysine, at weakly acidic pH and a temperature not exceeding 60° C until 60–90% by weight of L-lysine ester or acid-addition salts are resolved. The resolved L-lysine ester or acid-addition salts or acid-addition salts thereof thus produced by a conventional manner. The protease may be immobilized on an insoluble carrier in advance.

20 Claims, No Drawings

United States Patent

(11) 4,183,786
(15) Jan. 15, 1978

Nakayama et al.

- [54] PROCESS FOR PRODUCTION OF L-SERINE
[75] Inventors: Kyosai Nakayama, Suganohara, both of Machida, all of Japan
[73] Assignee: Kyowa Hakko Kogyo Co., Ltd., Japan
[21] Appl. No.: 853,328
[22] Filed: Nov. 28, 1977
[30] Foreign Application Priority Data
Nov. 30, 1976 [JP] Japan 51-143748
Dec. 8, 1976 [JP] Japan 51-143750
Dec. 20, 1976 [JP] Japan 51-153024
[51] Int. Cl.³ C12D 13/06
[52] U.S. Cl. 435/116; 435/872
[58] Field of Search 159/29, 47
References Cited
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3,463,441 10/1974 Kobata et al. 159/29
3,971,558 3/1975 Nakawara et al. 159/29

11 Claims, No Drawings

United States Patent

(11) 4,060,455
(15) Nov. 29, 1977

Wagner et al.

- [54] PROCESS FOR THE MICROBIAL PRODUCTION OF L-SERINE
[75] Inventors: Fritz Wagner, Braunschweig; Hermann Sam, Wolfenbüttel; Walter Hartmut Kneue, Braunschweig, all of Germany
[73] Assignee: Gesellschaft für Biotechnologische Braunschweig-Stöckheim, Germany
[21] Appl. No.: 747,725
[22] Filed: Dec. 6, 1976
[30] Foreign Application Priority Data
Dec. 4, 1975 Germany 2554/50
[51] Int. Cl.³ C12D 13/06
[52] U.S. Cl. 159/29; 159/49
[58] Field of Search 159/29, 76; 112, 28, 30
References Cited
U.S. PATENT DOCUMENTS
3,023,952 11/1971 Kobata et al. 159/29

United States Patent

(11) 4,260,684
(15) July 20, 1978

Tsuchida et al.

- [54] PROCESS FOR PRODUCING L-LEUCINE
[75] Inventors: Takayasu Tsuchida, Kawasaki; Haruo Momose, Kanakura, Yoshio Hirose, Fujiwara, all of Japan
[73] Assignee: Ajinomoto Co., Inc., Tokyo, Japan
[21] Filed: Mar. 4, 1975
[22] Filed: Mar. 4, 1975
[21] Appl. No.: 555,114
[30] Foreign Application Priority Data
Mar. 15, 1974 Japan 49-29645
[51] U.S. Cl. 159/29; 159/10; 159/47
[52] U.S. Cl. 159/47
[51] Int. Cl.³ C12D 13/06
[58] Field of Search 159/29, 30, 47

3 Claims, No Drawings

United States Patent

(11) 4,260,684
(15) Apr. 7, 1981

Schurt

- [54] STEREOSSELECTIVE RESOLUTION OF 4-HYDROXYPHENYLETHANES AND DERIVATIVES WITH ENZYME RESINS
[75] Inventor: Hermann Schurt, Wuppertal, Fed. Rep. of Germany
[73] Assignee: Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
[21] Appl. No.: 8,431
[22] Filed: Feb. 1, 1979
[30] Foreign Application Priority Data
Feb. 21, 1979 [DE] Fed. Rep. of Germany 2807246
[51] Int. Cl.³ C12P 13/04; C07B 19/02
[52] U.S. Cl. 435/126; 435/248; 560/37; 560/73; 560/41; 159/2, 29, 30; 562/443, 444, 500, 401; 560/37, 39, 41; 435/106, 128, 129, 135, 136, 174, 180, 181, 280
[58] Field of Search 435/126; 435/248; 560/37; 560/73; 560/41; 159/2, 29, 30; 562/443, 444, 500, 401; 560/37, 39, 41; 435/106, 128, 129, 135, 136, 174, 180, 181, 280

14 Claims, No Drawings

- [54] PROCESS FOR PRODUCING L-LEUCINE
[75] Inventors: Takayasu Tsuchida, Kawasaki; Haruo Momose, Kanakura, Yoshio Hirose, Fujiwara, all of Japan
[73] Assignee: Ajinomoto Co., Inc., Tokyo, Japan
[21] Filed: Mar. 4, 1975
[22] Filed: Mar. 4, 1975
[21] Appl. No.: 555,114
[30] Foreign Application Priority Data
Mar. 15, 1974 Japan 49-29645
[51] U.S. Cl. 159/29; 159/10; 159/47
[52] U.S. Cl. 159/47
[51] Int. Cl.³ C12D 13/06
[58] Field of Search 159/29, 30, 47

3 Claims, No Drawings

United States Patent

(11) 4,260,684
(15) Apr. 7, 1981

Schurt

- [54] STEREOSSELECTIVE RESOLUTION OF 4-HYDROXYPHENYLETHANES AND DERIVATIVES WITH ENZYME RESINS
[75] Inventor: Hermann Schurt, Wuppertal, Fed. Rep. of Germany
[73] Assignee: Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
[21] Appl. No.: 8,431
[22] Filed: Feb. 1, 1979
[30] Foreign Application Priority Data
Feb. 21, 1979 [DE] Fed. Rep. of Germany 2807246
[51] Int. Cl.³ C12P 13/04; C07B 19/02
[52] U.S. Cl. 435/126; 435/248; 560/37; 560/73; 560/41; 159/2, 29, 30; 562/443, 444, 500, 401; 560/37, 39, 41; 435/106, 128, 129, 135, 136, 174, 180, 181, 280
[58] Field of Search 435/126; 435/248; 560/37; 560/73; 560/41; 159/2, 29, 30; 562/443, 444, 500, 401; 560/37, 39, 41; 435/106, 128, 129, 135, 136, 174, 180, 181, 280

14 Claims, No Drawings

United States Patent

[11] 4,262,092

[45] Apr. 14, 1981

Bauer

PROCESS FOR PRODUCING N-ACYL-D-PHENYLALANINE ESTER

[75] Inventor: Dennis P. Bauer, Baton Rouge, La.

[73] Assignee: Ely Lilly Corporation, Richmond, Va.

[21] Appl. No.: 37,162

[22] Filed: May 8, 1979

[51] Int. Cl.³ C07B 19/02

[52] U.S. Cl. 435/280; 435/222; 435/223

[58] Field of Search 435/280

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9 Claims, No Drawings

United States Patent

[11] 4,248,967

[45] Feb. 3, 1981

Vigita et al.

ENZYMIC COMPLEXES ADAPTED TO CATALYZE THE HYDROLYSIS OF OPTICALLY ACTIVE AMINOACIDS, AND THEIR APPLICATIONS

[75] Inventors: Aurelio Vigita, Montebelluna, Eugenio Facetti, Rome, Elena Perleone, Rome, Ludvig Degén, Rome, all of Italy

[73] Assignee: Snamprogetti S.p.A., Milan, Italy

[21] Appl. No.: 885,194

[22] Filed: Mar. 10, 1978

[30] Foreign Application Priority Data Mar. 15, 1977 (IT) Italy

[51] Int. Cl.³ C12P 13/04; C07B 19/02

[52] U.S. Cl. 435/106; 435/280; 435/227; 435/132; 435/233

[58] Field of Search 195/2; 29; 62; 65; 435/280; 100-116

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4,084,341 12/1978 Cohen et al. 195/2

4,111,149 9/1978 Degén et al. 195/2

Primary Examiner—Lionel M. Shapiro

Attorney, Agent, or Firm—Morgan, Finnegan, Pike, Foley & Lee

ABSTRACT

Enzymic complexes deriving from micro-organisms belonging to the Bacillaceae family using an hydantoin as a cofactor are used for hydrolyzing racemic hydantoin into optically active aminoacids. The method of preparation is an enzymic hydantoin fostered by the enzymic deriv-

ation of the hydantoin with a cofactor, which can be effected at a comparatively high temperature, which can reach even 60° C.

4 Claims, 1 Drawing Figure

United States Patent

[19] 4,132,596

[11] 4,132,596

Meiller et al.

SUPPORT-AMINOACYLASE COMPLEXES

[75] Inventors: François Meiller, Palisieux; Bernard Mirabel, Fresnes, both of France

[73] Assignee: Rhone-Poulenc Industries, Paris, France

[21] Appl. No.: 799,117

[22] Filed: May 26, 1977

[30] Foreign Application Priority Data May 26, 1976 (FR) France

[51] Int. Cl.³ C07G 7/02

[52] U.S. Cl. 195/63; 195/79; 195/78

[58] Field of Search 195/79; 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000

[58] Field of Search 195/79; 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000

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United States Patent

Zhdanova et al.

[11] 4,237,228
[45] Dec. 2, 1980

- [54] METHOD OF PRODUCING L-ISOLEUCINE USING BREVI-BACTERIUM FLAVUM
- [76] Inventors: Nelli L. Zhdanova, Leningradskoe shosse, 112 korpus 3, kv. 748, body, 81 korpus 5, kv. 852; Ljudmila P. Koznyeva, 4 Novopodolskaya pereulok, 4, kv. 80, all of Moscow, U.S.S.R.
- [21] Appl. No.: 917,989
- [22] Filed: Jun. 22, 1978
- [23] Foreign Application Priority Data
- Jun. 29, 1977 [SU] U.S.S.R. 250219
- [51] Int. Cl. C12P 13/06; C12N 15/00; C12R 1/13
- [52] U.S. Cl. 435/116; 435/142
- [53] Field of Search 195/47, 96, 79, 112, 195/29, 435/106, 116, 172, 840
- [54] References Cited
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- 3,058,888 10/1966 Chiba et al. 195/29
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- FOREIGN PATENT DOCUMENTS
- 51-4337 2/1976 Japan 195/47
- 51-21077 6/1976 Japan 195/47
- 10 Claims, No Drawings

United States Patent

Goi et al.

[11] 4,226,941
[45] Oct. 7, 1980

- [54] PROCESS FOR THE OPTICAL RESOLUTION OF DL-2-AMINO-4-NITROPHOSPHONIC ACID
- [75] Inventors: Mitsuo Goi, Chiba; Shuji Miyajima; Takashi Shimura, both of Yokohama; Akira Suzuki, Tokyo; Tomoto Niwa; Yujiro Yamada, both of Yokohama, all of Japan
- [73] Assignee: Nippon Soda Co., Ltd., Tokyo, Japan
- [21] Appl. No.: 79,366
- [22] Filed: Sep. 27, 1979
- [51] Int. Cl. C07B 19/02
- [52] U.S. Cl. 435/106, 280
- [53] Field of Search 435/106, 280
- [54] References Cited
- U.S. PATENT DOCUMENTS
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- 3,527,671 9/1970 Zerk 435/280
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- 3,846,254 6/1972 Chiba et al. 435/280
- 3,841,966 10/1974 Soehoro 435/280
- 3,863,573 6/1976 Stauffer 435/280
- 15 Claims, No Drawings

United States Patent

Denny et al.

[11] 4,061,542
[45] Dec. 6, 1977

- [54] 2-METHYL-L-ARGININE PRODUCED BY CULTIVATING STREPTOMYCES STRAIN
- [75] Inventors: Thomas Cautin Denny, Livingston; Hubert Mark, Belleville, both of N.J.
- [73] Assignee: Hoffmann-La Roche Inc., Nutley, N.J.
- [21] Appl. No.: 664,834
- [22] Filed: Mar. 8, 1976
- [51] Int. Cl. C12N 1/13
- [52] U.S. Cl. 195/47; 195/29; 195/80 R
- [53] Field of Search 195/47, 96, 79, 112, 195/29, 435/106, 116, 172, 840
- [54] References Cited
- U.S. PATENT DOCUMENTS
- 3,345,466 12/1975 Berger et al. 195/80 R
- 3,893,445 1/1976 Berger et al. 195/80 R
- Primary Examiner—Alvin E. Tanshelle
- Attorney, Agent, or Firm—Samuel L. Wolf; Bernard S. Leon; William H. Epstein
- [75] ABSTRACT
- The compound 2-methyl-L-arginine having useful antibiotic and anti-bacterial properties and its methods of preparation from a new species of Streptomyces sp. X-11837 or from 2-hydroxy-2-pentanone.
- 2 Claims, No Drawings

United States Patent

Nakayama et al.

[11] 4,086,137
[45] Apr. 25, 1978

- [54] PROCESS FOR THE PRODUCTION OF L-ARGININE BY FERMENTATION
- [75] Inventors: Eiyoshi Nakayama, Saitamahara; Kenji Aoki, Mochioke, Japan; Yoshida, Saitamahara, all of Japan
- [73] Assignee: Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan
- [21] Appl. No.: 766,600
- [22] Filed: Feb. 8, 1977
- [51] Int. Cl. C12N 1/13
- [52] U.S. Cl. 195/47; 195/29; 195/80 R
- [53] Field of Search 195/47, 96, 79, 112, 195/29, 435/106, 116, 172, 840
- [54] References Cited
- U.S. PATENT DOCUMENTS
- 3,794,429 5/1973 Chiba et al. 195/47
- Primary Examiner—Alvin E. Tanshelle
- Attorney, Agent, or Firm—Hauptler, Colla, Harper & Scinto
- [75] ABSTRACT
- L-arginine is produced by fermentation of a microorganism belonging to the genus Bacillus capable of producing L-arginine and having a nutritional requirement for at least one compound of the group consisting of lysine, histidine, threonine, valine, leucine, isoleucine, lysine, alanine, glutamic acid and urea or its precursor. L-arginine is accumulated in the culture liquid and may be recovered therefrom.
- 9 Claims, No Drawings

[54] REGENERATION OF AN ENZYME
IMMOBILIZATION

[75] Inventors: Gualter H. Franzmann, Wilton; Hans-Lo H. Franzmann, Welter, both of Fed. Rep. of Germany
[73] Assignee: Dr. Albert N. Franzmann, Welter, both of Fed. Rep. of Germany

[21] Appl. No.: 39,482

[22] Filed: May 15, 1979

[30] Foreign Application Priority Data
May 19, 1978 [DE] Fed. Rep. of Germany 321890

[51] Int. Cl. C12N 1/04

[52] U.S. Cl. 435/176, 435/106

[53] Field of Search 435/174, 176, 181, 106

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6 Claims, No Drawings

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Primary Examiner—David M. Naff
Attorney, Agent, or Firm—Spring, Feltz, Horn, Lynch & Kramer

[75] Abstract

An enzyme immobilized comprising an amorphous adsorption support to which an enzyme is bound after the enzyme has become inactive by contacting the support with a solution of inorganic ammonium sulfate or a solution of primary, secondary, tertiary or quaternary C₁ to C₄ alkyl or hydroxy alkyl ammonium sulfate to desorb the enzyme solution to adsorb active enzyme to the support.

[54] PROCESS FOR PREPARING
D-N-CARBAMOYL-L-AMINO ACIDS

[75] Inventors: Hideaki Yamada, Kyoto; Satoru Takahashi, Takatsuki; Koji Yoneda, Atsugi; all of Japan
[73] Assignee: Kangaguchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

[*] Notice: The portion of the term of this patent subsequent to Jan. 13, 1992, has been disclaimed.

[21] Appl. No.: 862,483

[22] Filed: Dec. 21, 1977

[30] Foreign Application Priority Data

Dec. 30, 1976 [JP] Japan 51/27713

[51] Int. Cl. C12P 13/02

[52] U.S. Cl. 435/109, 435/110, 435/115, 435/116

[53] Field of Search 435/106, 108, 109, 110, 111, 112, 116

[56] References Cited

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8 Claims, No Drawings

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Journal of the Agricultural Chemical Society of Japan, vol. 43, No. 8, pp. 538-535 (1969).
Primary Examiner—Alvin F. Tannenholz
Attorney, Agent, or Firm—Armstrong, Niska, Armstrong & Kobrick

[75] Abstract

A process for preparing D-N-carbamoyl-L-amino acids and their salts by reacting a water-soluble amino acid with a cultured broth, cells or treated cells of microorganisms having an ability to asymmetrically hydrogenate the hydrogen ring in an aqueous medium of pH 7 to 10. The reaction is carried out in the presence of a water-soluble D-N-carbamoyl-L-amino acid which are useful intermediates for the preparation of medicines.

[54] PROCESS FOR PREPARING
N-CARBAMOYL-D-THIENYLGLYCINES

[75] Inventors: Hideaki Yamada, Kyoto; Satoru Takahashi, Kobe; Koji Yoneda, Atsugi; all of Japan
[73] Assignee: Kangaguchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

[*] Notice: The portion of the term of this patent subsequent to Jan. 13, 1992, has been disclaimed.

[21] Appl. No.: 48,476

[22] Filed: Mar. 9, 1979

[30] Foreign Application Priority Data

Mar. 15, 1978 [JP] Japan 53/3062

[51] Int. Cl. C12P 17/00

[52] U.S. Cl. 435/177, 435/106

[53] Field of Search 435/176, 435/106, 435/883, 435/874, 435/872, 435/886

[56] References Cited

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United States Patent

[19]

4,202,943

[11]

May 13, 1980

Suhara et al.

- [54] RESOLUTION OF A RACEMATE
[75] Inventors: Yasuji Suhara, Hiroshi Maruyama, Yohji Ohno, and Masahito Itoh, Yokohama, Kanagawa, Japan
[73] Assignee: Hoffmann-La Roche Inc., Nutley, N.J.
[21] Appl. No.: 932,842
[22] Filed: Jul. 12, 1978
[63] Continuation-in-part of Ser. No. 839,523, Oct. 5, 1977, abandoned.
[30] Foreign Application Priority Data
Oct. 12, 1976 [CH] Switzerland C12P 13/04
[51] Int. Cl. C12P 13/04
[52] U.S. Cl. 435/268, 435/106

- [54] Field of Search 195/2, 29, 435/260
[56] REFERENCES CITED
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3,971,760 7/1976 Ghislin et al. 195/2
OTHER PUBLICATIONS
Chemical Abstracts, vol. 82, 13276(p) 1975.
Chemical Abstracts, vol. 82, 29076(f) 1975.
Primary Examiner—Alvin E. Rosenblatt
Assistant Examiner—John S. Stutz, Bernard S. Leach, George W. Johnston
ABSTRACT
A process for the resolution of a racemate, namely of DL-N-benzoyl-L-phenylalanyl-2-(p-hydroxyphenyl)-glycine.
9 Claims, No Drawings

United States Patent

[19]

4,194,918

[11]

Jan. 22, 1980

Nakanori et al.

- [54] METHOD FOR PRODUCING 4-FORMYL-L-AMINO-BUTYRIC ACID (GLUTAMIC SEMIALDEHYDE)
[75] Inventors: Shigeru Nakanori, Yokohama; Kenzo Yokozaki, Kawasaki; Koji Mitsugi, Yokohama, all of Japan
[73] Assignee: Allinmedo Company Incorporated, Tokyo, Japan
[21] Appl. No.: 901,088
[22] Filed: Apr. 28, 1978
[30] Foreign Application Priority Data
May 2, 1977 [JP] Japan 55-90930
[51] Int. Cl. C12 13/06
[52] U.S. Cl. 435/106, 435/108, 435/842, 435/840
[54] Field of Search 195/47, 29, 30

- [56] REFERENCES CITED
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Blach et al., Biochim. Biophysica Acta, vol. 104, pp. 397-404 (1965).
Berg et al., Journal of Bacteriology, Jun. 1974, vol. 118, pp. 928-939 (Jun. 1974).
Primary Examiner—Lionel M. Shapiro
Attorney, Agent, or Firm—Ohno, Fisher, Spivak, Goldsmith & Walter
ABSTRACT
Method for producing 4-formyl-L-amino-butyric acid (FABA), which is useful in culturing a mutant capable of producing FABA and recovering the genus Brevibacterium or Corynebacterium in a culture medium. The culture medium of FABA has been isolated in the culture medium containing the deacetylated FABA from the culture medium.
6 Claims, No Drawings

United States Patent

[19]

4,251,631

[11]

Feb. 17, 1981

Simon

- [54] CROSS-LINKED ENZYME MEMBRANE
[75] Inventor: Shalomit Simon, Ramat Gan, Israel
[73] Assignee: Research Products Rebovet Ltd., Rehovot, Israel
[21] Appl. No.: 8,894
[22] Filed: Feb. 1, 1979
[30] Foreign Application Priority Data
Feb. 23, 1978 [IL] Israel 54116
[51] Int. Cl. C12M 1/48, C12N 9/76
[52] U.S. Cl. 435/106, 435/95, 435/137, 435/174, 435/185, 435/288, 435/280
[58] Field of Search 435/174, 176, 177, 180, 435/181, 288, 137, 131, 190, 69, 95, 106, 260

- [54] FOREIGN PATENT DOCUMENTS
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Zaborsky, O., Immobilized Enzymes, CRC Press, Cleveland, Ohio, 1973 (pp. 61-76).
Primary Examiner—David M. Naff
Attorney, Agent, or Firm—Million & White

- [54] METHOD FOR PRODUCING L-GLUTAMIC ACID BY FERMENTATION
[75] Inventor: Koji Takinami, Yokohama; Takashi Tanaka, Kawasaki; Shiroshi Tanaka, Kawasaki; Hiroe, Fujiwara, all of Japan
[73] Assignee: Ajinomoto Co., Inc., Tokyo, Japan
[21] Filed: Oct. 7, 1974
[22] Appl. No.: 512,480
[30] Foreign Application Priority Data
Oct. 17, 1973 Japan 48-16666
[52] U.S. Cl. 195/47; 195/79; 195/98; 195/112; 195/114
[51] Int. Cl. C12D 13/06; C12B 1/02
[58] Field of Search 195/96, 47, 112, 79, 195/29, 114
[56] REFERENCES CITED
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7,200,673 10/1972 Japan 195/47
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Chem. Abstracts 73:97360K.
Nakayama et al., "Induction of Nutritional Mutants of Glutamic Acid Bacteria and Their Amino Acid Accumulation," J. Gen. Appl. Microbiol., vol. 7, No. 1, (1961), pp. 41-51.
Primary Examiner—A. Louis Monacell
Assistant Examiner—Thomas G. Wiseman
Attorney, Agent, or Firm—Hans Bernan, Kurt Keimann

- ABSTRACT
A cross-linked enzyme membrane is prepared by directly adsorbing enzymes into the pores of a microporous membrane, cross-linking the adsorbed enzyme with vinylphosphoric polymer and then cross-linking the enzyme with a bi-functional coupling agent whereby enzyme molecules are cross-linked to each other with covalent bonds. The cross-linked enzyme membrane is used to carry out enzymatic reactions by passing a solution of substrate for the enzyme through the membrane under a pressure differential.
15 Claims, No Drawings

- [54] CROSS-LINKED ENZYME MEMBRANE
[75] Inventor: Shalomit Simon, Ramat Gan, Israel
[73] Assignee: Research Products Rebovet Ltd., Rehovot, Israel
[21] Appl. No.: 8,894
[22] Filed: Feb. 1, 1979
[30] Foreign Application Priority Data
Feb. 23, 1978 [IL] Israel 54116
[51] Int. Cl. C12M 1/48, C12N 9/76
[52] U.S. Cl. 435/106, 435/95, 435/137, 435/174, 435/185, 435/288, 435/280
[58] Field of Search 435/174, 176, 177, 180, 435/181, 288, 137, 131, 190, 69, 95, 106, 260
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- [56] REFERENCES CITED
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[54] METHOD FOR PRODUCING L-GLUTAMIC ACID BY FERMENTATION
[75] Inventor: Koji Takinami, Yokohama; Takashi Tanaka, Kawasaki; Shiroshi Tanaka, Kawasaki; Hiroe, Fujiwara, all of Japan
[73] Assignee: Ajinomoto Co., Inc., Tokyo, Japan
[21] Filed: Oct. 7, 1974
[22] Appl. No.: 512,480
[30] Foreign Application Priority Data
Oct. 17, 1973 Japan 48-16666
[52] U.S. Cl. 195/47; 195/79; 195/98; 195/112; 195/114
[51] Int. Cl. C12D 13/06; C12B 1/02
[58] Field of Search 195/96, 47, 112, 79, 195/29, 114
[56] REFERENCES CITED
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7,200,673 10/1972 Japan 195/47
OTHER PUBLICATIONS
Chem. Abstracts 73:97360K.
Nakayama et al., "Induction of Nutritional Mutants of Glutamic Acid Bacteria and Their Amino Acid Accumulation," J. Gen. Appl. Microbiol., vol. 7, No. 1, (1961), pp. 41-51.
Primary Examiner—A. Louis Monacell
Assistant Examiner—Thomas G. Wiseman
Attorney, Agent, or Firm—Hans Bernan, Kurt Keimann

1982 UPDATE

This section presents 1982 data for the six areas of Biotechnology defined and profiled earlier in this report. The 1982 Update Profiles begin on the following pages:

	<u>Page</u>
MUTATION/GENETIC ENGINEERING	239
ENZYMES PER SE	249
IMMOBILIZED ENZYMES	257
TISSUE CULTURE	263
STARCH HYDROLYSATES	269
AMINO ACIDS	275

The 1982 Update Profiles contain the following information:

- ° **Activity Indices:** For the years 1980-1982, averages are shown in five categories* -- Percent Growth, Percent Foreign Share, Percent Corporate Owned, Percent Government Owned, and Percent U.S. Owned of Foreign.
- ° **Patent Activity By Date:** Patent activity through December 1982 is shown in two tables. The first table presents the yearly distribution of patents by date of grant and country of origin or general ownership category. The second table distributes the same data by date of patented application.
- ° **Organizational Patenting:** This is an alphabetical list of organizations which received patents in the technology during 1982, and includes the patent numbers and titles.
- ° **Inventors of Individually Owned Patents:** For patents granted in 1982 which were unassigned or assigned to an individual at time of grant, this list shows the inventor's name and address and gives the patent number and title.

*Defined on page 5.

BIOTECHNOLOGY 1982 UPDATE - MUTATION/GENETIC ENGINEERING

PAGE A 1

1980-82 AVERAGES

PERCENT GROWTH	72.65
PERCENT FOREIGN	38.24
PERCENT CORPORATE OWNED	81.18
PERCENT GOVERNMENT OWNED	4.12
PERCENT U.S. OWNED OF FOREIGN	9.23
1980-82 XR/OR	.44

DEFINITIONS

PERCENT GROWTH = 1980-82 PATENTS/1973-82 PATENTS X 100.

PERCENT FOREIGN = 1980-82 U.S. PATENTS WITH A FOREIGN RESIDENT INVENTOR/1980-82 PATENTS X 100

PERCENT CORPORATE OWNED = 1980-82 U.S. PATENTS ASSIGNED TO CORPORATIONS/1980-82 PATENTS X 100.

PERCENT GOVERNMENT OWNED = 1980-82 U.S. PATENTS ASSIGNED TO THE U.S. AND FOREIGN GOVERNMENTS/1980-82 PATENTS X 100.

PERCENT U.S. OWNED OF FOREIGN = 1980-82 U.S. PATENTS WITH A FOREIGN RESIDENT INVENTOR THAT ARE ASSIGNED TO A U.S. ORGANIZATION/1980-82 U.S. PATENTS WITH A FOREIGN RESIDENT INVENTOR X 100.

1980-82 XR/OR = 1980-82 U.S. PATENTS WITH A CROSS REFERENCE DESIGNATION/1980-82 U.S. PATENTS WITH AN ORIGINAL PRIMARY DESIGNATION.

ETIC ENGINEERING
PATENT ACTIVITY (1/63-12/82) BY DATE OF PATENT GRANT

PAGE A 2

BIOTECHNOLOGY 1982 UPDATE - MUTATION/GENETIC ENGINEERING

PATENT ACTIVITY (PATENTS GRANTED 1/67-12/82) BY DATE OF PATENT APPLICATION

		NUMBER OF PATENTED APPLICATIONS-														PAGE A 4	
		PRE 69	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	TOTAL
TOTAL	ORIGIN	13	5	5	3	7	8	12	15	11	16	23	50	68	17	1	254
U.S.	ORIGIN	6	3	1	1	3	3	4	8	6	7	17	29	38	13	1	140
FOREIGN	ORIGIN	7	2	4	2	4	5	8	7	5	9	6	21	30	4		114
JAPAN		4		2	1	1	1	3	3	2	2	2	7	13	1		37
FRANCE																	
WEST GERMANY																	
UNITED KINGDOM																	
SWITZERLAND																	
ISRAEL																	
NETHERLANDS																	
CANADA																	
U.S.S.R.																	
ITALY																	
AUSTRIA																	
AUSTRIA																	
AUSTRIA																	
HUNGARY																	
HUNGARY																	
HUNGARY																	
SPAIN																	
DENMARK																	
MEXICO																	
U.S. ORIGIN		6	3	1	1	3	3	4	8	6	7	17	29	38	13	1	140
U.S. CORP. OWNED		5	3	1	1	2	3	4	7	6	7	15	27	25	11	1	118
U.S. GOVT. OWNED																	
U.S. INDIV. OWNED		1				1			1			1	2	10	2		17
FOREIGN OWNED																	
FOREIGN ORIGIN		7	2	4	2	4	5	8	7	5	9	6	21	30	4		114
U.S. OWNED		1			2		1		1	1				4	1		11
FOREIGN OWNED		7	1	4		4	4	8	7	4	9	6	20	26	3		103
FOREIGN CORP.		7	1	3		4	4	6	5	4	8	4	15	20	3		84
FOREIGN GOVT.																	
FOREIGN INDIV.				1				2	2		1	2	4	4			15

BIOTECHNOLOGY 1982 UPDATE - MUTATION/GENETIC ENGINEERING
ORGANIZATIONAL PATENTING

ABBOTT LABORATORIES

4331589 - OEOXYRIBONUCLEIC ACID SYNTHESIS USING BINDING PROTEIN EXTRACTED FROM CHICK EMBRYO FIBROBLASTS

AJINOMOTO COMPANY INCORPORATED

4336169 - METHOD FOR PRODUCING L-GLUTAMIC ACID BY FERMENTATION
4346169 - METHOD FOR PRODUCING L-ARGININE BY FERMENTATION
4346170 - METHOD FOR PRODUCING L-LYSINE BY FERMENTATION
4347317 - METHOD FOR PRODUCING L-GLUTAMIC ACID BY FERMENTATION
4347318 - METHOD FOR PRODUCING L-THREONINE BY FERMENTATION

ASTRA LAKEMEDEL AKTIEBOLAG

4339445 - METHOD FOR COMBATING VIRUS INFECTION

BETHESDA RESEARCH LABORATORY

4342833 - IMMOBILIZED RESTRICTION ENDONUCLEASES

BOARD OF REGENTS, THE UNIVERSITY OF TEXAS SYSTEM

4328209 - CHOLERA VACCINE

CETUS CORPORATION

4351901 - METHOD FOR SINGLE NUCLEOTIDE ALTERATION

CHILDREN'S HOSPITAL MEDICAL CENTER

4345026 - MUTAGENICITY ASSAY

C M INDUSTRIES

4340535 - CYTOTOXIC PRODUCTS FORMED BY COVALENT BONDING OF THE A CHAIN OF RICIN WITH AN ANTIBODY AND THE PROCESS FOR THE
IR PREPARATION AND USE

ELI LILLY AND COMPANY

4309504 - PROCESS FOR PREPARING NARASIN
4316959 - PROCESS FOR PRODUCTION OF ANTIBIOTIC FROM STREPTOMYCES
4322497 - PROCESS FOR TRANSLOCING +1 ESCHERICHIA COLI +B K12 +102 1776
4329472 - ANTIBIOTIC A-33853 AND THE TETRACETYL DERIVATIVE THEREOF
4342829 - PROCESS FOR PREPARING NARASIN

ENDOMONT AND ALUMNI FOUNDATION AT MONTANA STATE UNIVERSITY

4342746 - METHOD FOR TREATING OUTCH ELM DISEASE

ENDOMONT AND RESEARCH FOUNDATION AT MONTANA STATE UNIVERSITY

4338298 - VACCINE FOR PASSIVE IMMUNIZATION AGAINST ENTERIC COLIBACILLOSIS AND METHOD OF USE

ENS BIO LOGICALS INC.

4353989 - CHEMICAL SYNTHESIS APPARATUS FOR PREPARATION OF POLYNUCLEOTIDES

FARMITALIA CARLO ERBA, S. P. A.

4309503 - PREPARATION OF 11-DEOXY ANTHRACYCLINE ANTIBIOTICS

FORSYTH DENTAL INFIRMARY FOR CHILDREN

4324860 - LACTATE DEHYDROGENASE MUTANTS OF +1 STREPTOCOCCUS MUTANS

FRANHOFFER-GESELLSCHAFT ZUR FORDERUNG DER ANGEWANDTEN FORSCH

4306860 - INTEGRATED SERIES-CONNECTED SOLAR CELL

G. O. SEARLE & CO.

4349629 - PLASMO VECTORS, PRODUCTION ANDUSE THEREOF
4357421 - SYNTHETIC GENE CODING FOR INFLUENZA HEMAGGLUTININ

ORGANIZATIONAL PATENTING

GENENTECH, INC.

- 4310662 - NUCLEOSIDIC PHOSPHORYLATING AGENT AND METHODS
- 4342832 - METHOD OF CONSTRUCTING A REPLICABLE CLONING VEHICLE HAVING QUASI-SYNTHETIC GENES
- 4356270 - RECOMBINANT DNA CLONING VEHICLE
- 4366246 - METHOD FOR MICROBIAL POLYPEPTIDE EXPRESSION

GESELLSCHAFT FÜR STRAHLEN- UND UMWELTFORSCHUNG MBH MÜNCHEN

- 4352538 - APPARATUS FOR MEASURING PARTICLE CHARACTERISTICS
- GIST-BROCADES N.V.
- 4341871 - ACTIVE ORIED BAKER'S YEAST

GREEN CROSS CORPORATION

- 4313938 - INTERFERON INDUCER AND METHOD OF PREPARING SAME

HENKEL KOMMANDITGESELLSCHAFT AUF AKTIEN(HENKEL KGAA)

- 4320195 - STEROID PRODUCTION
- 4362815 - PROCESS FOR THE PREPARATION OF DEFECTIVE MUTANTS OF MICROORGANISMS

INSTITUT NATIONAL DE LA RECHERCHE AGRONOMIQUE

- 4300560 - PROCESS FOR PRODUCING FOOD PROTEINS OF FUNGAL ORIGIN OR FROM MULTICELLULAR ORGANISMS FERMENTATION APPARATUS AND PROTEINS SO-PRODUCED
- 4350684 - PREPARATION OF *1 SALMONELLA ABORTUS OVIS \ STRAINS AND VACCINE COMPOSITIONS CONTAINING THEM

INTERNATIONAL INSTITUTE OF DIFFERENTIATION LIMITED

- 4316962 - NOVEL CELL LINE

JAPAN FOUNDATION FOR ARTIFICIAL ORGANS

- 4350156 - METHOD AND APPARATUS FOR ON-LINE FILTRATION REMOVAL OF MACROMOLECULES FROM A PHYSIOLOGICAL FLUID

KUREHA KAGAKU KORYO KABUSHIKI KAISHA

- 4319851 - PHARMACEUTICAL COMPOSITION HAVING ANTITUMOR ACTIVITY

LESAFFRE ET CIE

- 4318929 - PROCESS FOR OBTAINING NEW STRAINS OF YEAST FOR BREAD-MAKING AND NOVEL STRAINS OF YEAST THUS PREPARED
- 4318930 - STRAINS OF YEAST FOR BREAD-MAKING AND NOVEL STRAINS OF YEAST THUS PREPARED

LEVER BROTHERS COMPANY

- 4329448 - MICROBIAL HETEROPOLYSACCHARIDE
- 4357423 - MICROBIAL HETEROPOLYSACCHARIDE

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

- 4332899 - PROCESS FOR PRODUCING MALTASE

MAX-PLANCK-GESELLSCHAFT ZUR FÖRDERUNG DER WISSENSCHAFTEN E.V

- 4331764 - SEMINAL PLASMA RIBONUCLEASE AND METHOD FOR ITS RECOVERY

MILES LABORATORIES, INC.

- 4355103 - NOVEL STRAIN OF +I BACILLUS LICHENIFORMIS \ USEFUL IN THE PRODUCTION OF GLUCOSE ISOMERASE AND METHOD OF SCREENING BACILLUS MUTANTS FOR ABILITY TO PRODUCE GLUCOSE ISOMERASE IN THE ABSENCE OF XULOSE
- 4358604 - N-AMINOALKYL L-GLUTAMINE DERIVATIVES

MITSUBISHI PETROCHEMICAL CO., LTD.

- 4326029 - PROCESS FOR PRODUCTION OF L-ASPARTIC ACID

NATIONAL RESEARCH DEVELOPMENT CORPORATION

- 4350663 - ANTIBODY PRODUCTION FROM HYBRID CELL LINE
- 4360597 - STREPTOMYCES PLASMID AND CULTURE

ORGANIZATIONAL PATENTING

NDDA INSTITUTE FOR SCIENTIFIC RESEARCH

- 4332897 - NOVEL BACTERIOPHAGE AND METHOD FOR PREPARING SAME
- 4348477 - METHOD FOR PREPARING A RECOMBINANT ONA PHAGE
- 4348478 - METHOD FOR PREPARATION OF A RECOMBINANT ONA PHAGE

NORDEN LABORATORIES, INC.

- 4328210 - MODIFIED PASTEURRELLA BACTERIA AND VACCINES PREPARED THEREFROM
- 4335106 - PROCESSES FOR THE GROWTH OF A MODIFIED +I PASTEURRELLA MULTICLOA \ BACTERIA AND PREPARATION OF A VACCINE THEREFROM

ORTHO PHARMACEUTICAL CORPORATION

- 4331901 - METHOD FOR PREPARING MONOCLONAL ANTIBODY TO HUMAN T CELLS, AND METHODS OF PREPARING SAME
- 4361550 - COMPLEMENT-FIXING MONOCLONAL ANTIBODY TO HUMAN SUPPRESSOR T CELLS AND METHODS OF PREPARING SAME
- 4363799 - MONOCLONAL ANTIBODY TO HUMAN T CELLS, AND METHODS FOR PREPARING SAME
- 4364932 - MONOCLONAL ANTIBODY TO HUMAN CYTOTOXIC AND SUPPRESSOR T CELLS AND METHODS OF PREPARING SAME
- 4364933 - MONOCLONAL ANTIBODY TO A HUMAN THYMOCYTE ANTIGEN AND METHODS OF PREPARING SAME
- 4364935 - MONOCLONAL ANTIBODY TO A HUMAN PROTHYMOCYTE ANTIGEN AND METHODS OF PREPARING SAME
- 4364936 - MONOCLONAL ANTIBODY TO A HUMAN MONOCYTE ANTIGEN AND METHODS OF PREPARING SAME
- 4364937 - MONOCLONAL ANTIBODY TO A HUMAN T CELL ANTIGEN AND METHODS OF PREPARING SAME

PALO ALTO MEDICAL RESEARCH FOUNDATION

- 4361647 - SANDWICH IMMUNOASSAY AND COMPOSITIONS FOR USE THEREIN

PETROLEUM FERMENTATIONS N.V.

- 4311829 - APO-+62 -EMULSANS
- 4311830 - APO-+60 -EMULSANS
- 4311831 - APO-+104 -EMULSANS
- 4311832 - PROEMULSANS

PRESIDENT AND FELLOWS OF HARVARD COLLEGE

- 4332892 - PROTEIN SYNTHESIS
- 4332901 - CLONING VECTOR
- 4336336 - FUSED GENE AND METHOD OF MAKING AND USING SAME
- 4338397 - MATURE PROTEIN SYNTHESIS

PUBLIC HEALTH LABORATORY SERVICE, CENTER FOR APPLIED MICROBI

- 4342827 - PRODUCTION OF ENZYMES

REGENTS OF UNIVERSITY OF CALIFORNIA

- 4322499 - ADRENOCORTICOTROPIN-LIPOTROPIN PRECURSOR GENE
- 4350764 - MICROBIOLOGICAL SYNTHESIS OF BETA ENDORPHIN
- 4363877 - RECOMBINANT DNA TRANSFER VECTORS

RESEARCH CORPORATION

- 4321365 - OLIGONUCLEOTIDES USEFUL AS ADAPTORS IN DNA CLONING, ADAPTED ONA MOLECULES, AND METHODS OF PREPARING ADAPTORS A NO ADAPTED MOLECULES
- 4337314 - GENETICALLY ATTENUATED BACTERIAL VACCINES WITH MULTIPLE MUTATIONS OF THE SAME PHENOTYPE
- 4362867 - RECOMBINANT CDNA CONSTRUCTION METHOD AND HYBRID NUCLEOTIDES USEFUL IN CLONING

SALK INSTITUTE FOR BIOLOGICAL STUDIES

- 4316891 - EXTENDED N-TERMINAL SOMATOSTATIN

SANRAKU-OCEAN CO., LTD.

- 4337312 - PROCESS FOR PRODUCING ANTHRACYCLINE GLYCOSIDES

SCHERING CORPORATION

- 4315852 - EXTRACTION OF INTERFERON FROM BACTERIA

BIOTECHNOLOGY 1982 UPDATE - MUTATION/GENETIC ENGINEERING

ORGANIZATIONAL PATENTING

SCRIPPS CLINIC AND RESEARCH FOUNDATION
4342566 - SOLID PHASE ANTI-C3 ASSAY FOR DETECTION OF IMMUNE COMPLEXES
4361509 - ULTRAPURIFICATION OF FACTOR VIII USING MONOCLONAL ANTIBODIES

SERONO LABORATORIES, INC.

4311688 - COMPOSITION AND METHOD FOR CANCER DETECTION IN HUMANS

SLOAN-KETTERING INSTITUTE FOR CANCER RESEARCH

4317877 - PROCESS FOR DETECTING THE PRESENCE OF MALIGNANT AND PRE-MALIGNANT CELLS IN HUMANS

SUMITOMO CHEMICAL COMPANY, LIMITED

4332717 - PURIFICATION OF HUMAN GROWTH HORMONE

SYBRON CORPORATION

4350770 - MICROBIOLOGICAL PROCESS FOR REMOVING OLEAGINOUS MATERIAL FROM WASTEWATER AND MICROBIOLOGICAL COMBINATION CAPABLE OF SAME

TEIJUN LIMITED

4350626 - ANTITUMOR HYBRID AND PROCESS FOR THE PREPARATION THEREOF
4352773 - ANTITUMOR PROTEIN HYBRID AND PROCESS FOR THE PREPARATION THEREOF
4363758 - CYTOTOXIC PROTEIN HYBRID AND PROCESS FOR THE PREPARATION THEREOF

TRANSAGRA CORPORATION

4349569 - METHOD OF CULTURING +I LACTOBACILLUS ACIDOPHILUS

UNITED STATES DEPARTMENT OF HEALTH & HUMAN SERVICES

4356117 - CHEMICAL MODIFICATIONS OF PROTEINS WHICH INDUCE NEW RECEPTOR SPECIFICITIES AND THEREFORE ELICIT NEW EFFECTS IN CELLS

UNIVERSITY OF SASKATCHEWAN

4311797 - ANUCLEATED LIVE +I E. COLI +B VACCINE

UNIVERSITY PATENTS, INC.

4332785 - IMMUNOASSAY FOR MEASUREMENT OF RETICULOCYTES, AND IMMUNOREACTIVE REAGENTS FOR USE THEREIN

UPJOHN COMPANY

4332868 - HYBRID PLASMID AND PROCESS OF MAKING SAME
4332868 - CONSTRUCTION OF CO-INTEGRATE PLASMIDS FROM PLASMIDS OF STREPTOMYCES AND ESCHERICHIA
4338400 - CO-INTEGRATE PLASMIDS AND THEIR CONSTRUCTION FROM PLASMIDS OF ESCHERICHIA AND STREPTOMYCES
4340874 - CO-INTEGRATE PLASMIDS AND THEIR CONSTRUCTION FROM PLASMIDS OF ESCHERICHIA AND STREPTOMYCES
4343906 - HYBRID PLASMID OF PBR322 AND STREPTOMYCES PLASMID AND +I E. COLI +B CONTAINING SAME
4345033 - +I MYCOBACTERIUM FORTUITUM +B MUTANT
4362816 - HYBRID PLASMID AND PROCESS OF MAKING SAME
4362817 - HYBRID PLASMID AND PROCESS OF MAKING SAME

WISTAR INSTITUTE

4349528 - MONOCLONAL HYBRIDOMA ANTIBODY SPECIFIC FOR HIGH MOLECULAR WEIGHT CARCINOEMBRYONIC ANTIGEN

INVENTORS OF INDIVIDUALLY OWNED PATENTS			(ALPHA LISTING)		ST	ZIP/CNTRY
INVENTOR NAME	STREET	CITY				
BELJANSKI	MIRKO	PARIS	FR			
4335239	- POLYRIBONUCLEOTIDES CAPABLE OF PROMOTING THE GENESIS OF LEUCOCYTES AND BLOOD PLATELETS					
BRANEMARK	PER	MD LNOAL	SE			
4330891	- ELEMENT FOR IMPLANTATION IN BODY TISSUE, PARTICULARLY BONE TISSUE					
CERDA OLMEDO	ENRIQUE	SEVILLA	ES			
4318987	- +62 -CAROTENE PRODUCING STRAINS OF THE FUNGUS PHYCOMYCES BLAKESLEENUS					
DEBAOV	VLADIMIR	MOSCOW	SU			
4321325	- PROCESS FOR PRODUCING L-THREONINE					
FUDENBERG	HUGH	ISLE OF PALMS	SC	29451		
4322274	- METHOD OF DIAGNOSING CYSTIC FIBROSIS PATIENTS AND ASYMPTOMATIC CARRIER OF THE CYSTIC FIBROSIS GENE					
GOLDENBERG	MILTON	POTOMAC	MD	20854		
4321647	- TUMOR LOCALIZATION AND THERAPY WITH LABELED ANTIBODY FRAGMENTS SPECIFIC TO TUMOR-ASSOCIATED MARKERS					
4348376	- TUMOR LOCALIZATION AND THERAPY WITH LABELED ANTI-CEA ANTIBODY					
4361544	- TUMOR LOCALIZATION AND THERAPY WITH LABELED ANTIBODIES SPECIFIC TO INTRACELLULAR TUMOR-ASSOCIATED MARKERS					
GORDON	ROBERT	SKOKIE	IL	60076		
4359453	- ATHEROSCLEROSIS TREATMENT METHOD					
KHURGES	EUGENY	MOSCOW	SU			
4321325	- PROCESS FOR PRODUCING L-THREONINE					
LOPEZ CALDERON	ISABEL	SEVILLA	ES			
4318987	- +62 -CAROTENE PRODUCING STRAINS OF THE FUNGUS PHYCOMYCES BLAKESLEENUS					
MITANI	IKUSABURO	FUNABASHI-SHI, CHIBA	JP			
4332496	- INDUXIDUS INTERFERON-INDUCING SUBSTANCE, INDUCING AGENT AND PROCESS FOR PRODUCING SAME					
MURTLID ARAUJO	FRANCISCO	SEVILLA	ES			
4318987	- +62 -CAROTENE PRODUCING STRAINS OF THE FUNGUS PHYCOMYCES BLAKESLEENUS					
NEVILLE	DAVID	BETHESDA	MD	20014		
4359457	- ANTI THY 1.2 MONOCLONAL ANTIBODY-RICIN HYBRID UTILIZED AS A TUMOR SUPPRESSANT					
PIECZENIK	GEORGE	NEW YORK	NY	10024		
4359535	- AUTONOMOUSLY REPLICATING DNA CONTAINING INSERTED DNA SEQUENCES					
ROSENBERG	RALPH	HIGHLAND PARK	NJ	08904		
4332893	- PROCESS FOR THE PRODUCTION OF AN INSULIN-PRODUCING CELL LINE OF PANCREATIC BETA CELLS					
RUBIN	HARVEY	SAN DIEGO	CA	92103		
4358566	- DETECTION AND ISOLATION OF ENDOPHIN MRNA USING A SYNTHETIC OLIGODEOXYNUCLEOTIDE					
SHANBROM	EDWARD	SANTA ANA	CA	92705		
4315919	- DEPYROGENATION PROCESS					
SING	EDMOND	INDIANAPOLIS	IN	46226		
4351904	- BLEND OF NORMAL AND MUTANT +I STREPTOCOCCUS DIACETILACTIS					

BIOTECHNOLOGY 1982 UPDATE - MUTATION/GENETIC ENGINEERING

PAGE D 2

INVENTORS OF INDIVIDUALLY OWNED PATENTS			(ALPHA LISTING)		ST	ZIP/CNTRY
INVENTOR NAME	STREET	CITY				
SKURKOVICH	SIMON V.	261 CONGRESSIONAL LA. . . +190.70	ROCKVILLE	MD	20852	
4362155 - METHOD AND APPARATUS FOR THE TREATMENT OF AUTOIMMUNE AND ALLERGIC DISEASES						
SOKOLOV	ALEXANDR K.	LEVSHINSKY, MARY PEREULOK, 14/	MOSCOW	SU		
4321325 - PROCESS FOR PRODUCING L-THREONINE						
SUGAR	STEPHEN	21 LOUIS ST.	STATEN ISLAND	NY	10304	
4343895 - ENCAPSULATED ANTIGENIC TUMOR SPECIFIC SUBSTANCES AND METHODS FOR DETECTING CANCER USING SAID SUBSTANCES						
THURESSON AF EKENSTABO	S-412 53	GO TEBORG		SE		
4330891 - ELEMENT FOR IMPLANTATION IN BODY TISSUE, PARTICULARLY BONE TISSUE						
WILSON	GREGORY B.	2706 CAMERON BLVD.	ISLE OF PALMS	SC	29451	
4322274 - METHOD OF DIAGNOSING CYSTIC FIBROSIS PATIENTS AND ASYMPTOMATIC CARRIER OF THE CYSTIC FIBROSIS GENE						
YOLE	RICHARD J.	9629 OLD SPRING RD.	KENSINGTON	MD	20795	
4359457 - ANTI THY 1.2 MONOCLONAL ANTIBODY-RICIN HYBRID UTILIZED AS A TUMOR SUPPRESSANT						
ZHDANOVA	NELLI I.	LENINGRADSKOE SHOSSE, 112, KOR	MOSCOW	SU		
4321325 - PROCESS FOR PRODUCING L-THREONINE						

1980-82 AVERAGES

PERCENT GROWTH	31.94
PERCENT FOREIGN	47.50
PERCENT CORPORATE OWNED	90.00
PERCENT GOVERNMENT OWNED	1.56
PERCENT U.S. OWNED OF FOREIGN	10.53
1980-82 XR/OR	2.56

DEFINITIONS

PERCENT GROWTH = 1980-82 PATENTS/1973-82 PATENTS X 100.

PERCENT FOREIGN = 1980-82 U.S. PATENTS WITH A FOREIGN RESIDENT INVENTOR/1980-82 PATENTS X 100

PERCENT CORPORATE OWNED = 1980-82 U.S. PATENTS ASSIGNED TO CORPORATIONS/1980-82 PATENTS X 100.

PERCENT GOVERNMENT OWNED = 1980-82 U.S. PATENTS ASSIGNED TO THE U.S. AND FOREIGN GOVERNMENTS/1980-82 PATENTS X 100.

PERCENT U.S. OWNED OF FOREIGN = 1980-82 U.S. PATENTS WITH A FOREIGN RESIDENT INVENTOR THAT ARE ASSIGNED TO A U.S. ORGANIZATION/1980-82 U.S. PATENTS WITH A FOREIGN RESIDENT INVENTOR X 100.

1980-82 XR/OR = 1980-82 U.S. PATENTS WITH A CROSS REFERENCE DESIGNATION/1980-82 U.S. PATENTS WITH AN ORIGINAL PRIMARY DESIGNATION.

BIOTECHNOLOGY 1982 UPDATE - ENZYMES PER SE

PATENT ACTIVITY (1/63-12/82) BY DATE OF PATENT GRANT

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	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	TOTAL
63-68															
238	48	40	88	117	99	110	119	103	129	91	31	86	121	113	1533
149	37	20	49	49	49	40	44	36	58	47	13	44	64	60	759
FOREIGN ORIGIN	89	11	20	39	68	50	70	67	71	44	18	42	57	53	774
JAPAN	35	6	7	16	35	33	37	30	23	16	8	23	27	27	356
WEST GERMANY	12	5	10	12	3	7	12	10	10	7	4	6	5	7	185
UNITED KINGDOM	1	1	2	2	3	2	8	8	4	2	2	5	2	7	46
FRANCE	8	2	2	2	4	4	8	4	2	2	3	3	3	3	28
DENMARK	2	1	3	1	2	1	5	3	3	3	1	1	5	3	23
ITALY	2	1	2	1	1	6	1	2	2	1	2	2	3	1	22
NETHERLANDS	1	2	1	1	1	3	1	1	2	4	2	1	1	1	20
SWITZERLAND	5	1	3	2	1	3	3	2	2	1	2	2	1	1	18
CANADA	3	1	1	2	1	2	1	1	1	1	1	1	1	1	10
SWEDEN	4	1	3	1	1	1	1	1	1	3	2	1	2	1	10
U.S.S.R.	1														8
S. AFRICA															4
AUSTRALIA															3
AUSTRIA															3
SPAIN															3
FINLAND															2
IRELAND															2
ISRAEL															2
MEXICO															2
BULGARIA															2
CZECHOSLOVAKIA															2
NEW ZEALAND															1
U.S. OWNED															1
ROMANIA															1
HONG KONG															1
CHINA - REP.															1
HUNGARY															1
IRAN															1
U.S. ORIGIN	149	37	20	49	49	40	44	36	58	47	13	44	64	60	759
U.S. CORP. OWNED	125	30	19	44	44	39	34	32	54	42	11	40	54	51	654
U.S. GOVT. OWNED	5	2	2	1	5	4	4	1	1	3	1	4	2	7	77
U.S. INDIV. OWNED	17	5	1	3	4	4	6	3	3	2	1	4	8	7	77
FOREIGN OWNED	2														1
FOREIGN ORIGIN	89	11	20	39	68	50	70	67	71	44	18	42	57	53	774
U.S. OWNED	4	1	2	8	8	3	6	5	5	4	2	4	7	5	70
FOREIGN OWNED	85	10	18	31	60	47	64	70	66	40	16	38	50	48	704
FOREIGN CORP.	74	10	14	30	50	45	60	66	51	36	15	35	46	45	633
FOREIGN INDIV.	11		4	1	10	2	4	2	10	4	1	3	3	2	66

BIOTECHNOLOGY 1982 UPDATE - ENZYMES PER SE

PATENT ACTIVITY (PATENTS GRANTED 1/67-12/82) BY DATE OF PATENT APPLICATION

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		NUMBER OF PATENTED APPLICATIONS-															TOTAL	
		PRE 69	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	TOTAL	
TOTAL		246	92	81	97	91	82	96	112	111	67	67	124	89	20	1	1376	
U.S. ORIGIN		148	43	32	42	36	32	38	46	58	30	37	60	45	14		661	
FOREIGN ORIGIN		98	49	49	55	55	50	58	66	53	37	30	64	44	6	1	715	
JAPAN		33	30	26	34	26	19	28	24	19	14	16	34	22	5	1	330	
WEST GERMANY		23	5	9	2	6	8	11	8	7	9	3	6	9	1	1	108	
UNITED KINGDOM		7	5	4	3	6	7	5	15	4	5	2	8	5			76	
FRANCE		6	1	3	5	5	5	4	8	1	2	1	1				41	
DENMARK		8	3		2	3	1	3	4	1	1	1	3	2			28	
NETHERLANDS		2	1		2	1	1	2	3	4	1	5	1	1			21	
IRELAND		2	1		4	3	1	1	1	1	2	1	4	1			21	
SWITZERLAND		4															4	
CANADA		4		3	2	3	2	2	1	4	2			1			18	
SWEEN		2	1	2	2		1										15	
BELGIUM		3	2		1		1	1	1	1	1	1	2				11	
U.S. S. R.							1	1	1	1	1		2	1			10	
S. AFRICA							1	1	1	1	1						8	
AUSTRALIA		1					1	1	1	1	1						4	
AUSTRIA		1					1	1	1								4	
SPAIN		1							1								3	
FINLAND									1	1			1				3	
IRELAND				1									1				2	
ISRAEL		1					1		1				1				2	
MEXICO													1				2	
BULGARIA									1				1				2	
CZECHOSLOVAKIA							1						1				2	
NEW ZEALAND														2			2	
ROMANIA																	2	
HONG KONG					1												1	
CHINA P. REP.		1		1													2	
HUNGARY					1												2	
IRAN									1								2	
U.S. ORIGIN		148	43	32	42	36	32	38	46	58	30	37	60	45	14		661	
U.S. CORP. OWNED		128	39	26	34	32	27	30	43	55	20	31	55	39	13		572	
FOREIGN CORP. OWNED		20	14	6	8	4	5	8	3	3	10	6	5	6	1		85	
U.S. INDIV. OWNED		9	2	5	3	4	4	4	2	2	7	5	5	4	1		56	
FOREIGN INDIV. OWNED		3		1	1						1			1			7	
FOREIGN OWNED																		
FOREIGN ORIGIN		98	49	49	55	55	50	58	66	53	37	30	64	44	6	1	715	
U.S. OWNED		10	5	5	7	5	4	4	5	3	4	4	10	5			67	
FOREIGN OWNED		88	44	44	48	50	46	54	61	50	33	30	54	39	6	1	648	
FOREIGN CORP.		79	40	38	45	49	41	47	47	47	31	28	48	38	6	1	585	
FOREIGN GOVT.																	5	
FOREIGN INDIV.		9	4	6	3	1	4	6	13	3	2	2	4	1			58	

ABBOTT LABORATORIES

4326033 - MODIFIED UROKINASE HAVING EXTENDED ACTIVITY AND METHOD OF MAKING
4341865 - DETERMINATION OF THYROXINE BINDING GLOBULIN

A. E. STALEY MANUFACTURING COMPANY

4310628 - FRUCTOSE PRODUCTION

AKZONA INCORPORATED

4331761 - STABILIZATION OF PEROXIDASE

AMANO PHARMACEUTICAL CO., LTD.

4360591 - PROCESS FOR THE DETERMINATION OF FREE FATTY ACIDS

APPLIED MEDICAL DEVICES, INC.

4363319 - READY-TO-USE BANDAGE INCORPORATING A COAGULANT COMPOSITION AND METHOD OF PREPARING SAME

ASAHU KASEI KOGYO KABUSHIKI KAISHA

4317882 - PRODUCTION OF PLASMINOGEN ACTIVATOR
4328314 - PROCESS FOR PRODUCING PLASMINOGEN ACTIVATOR

BASF AKTIENGESELLSCHAFT

4315002 - SOLID PHARMACEUTICAL OR DIAGNOSTIC AGENT CONTAINING DEXTRAN AND ITS PREPARATION

BECKMAN INSTRUMENTS INC.

4309502 - ENZYMIC ASSAY FOR GLYCEROL AND TRIGLYCERIDES AND A REAGENT FOR USE THEREIN
4325832 - ENZYME REFERENCE COMPOSITION

BETHESDA RESEARCH LABORATORY

4342833 - IMMOBILIZED RESTRICTION ENDONUCLEASES

BOEHRINGER MANNHEIM G.M.B.H.

4330620 - METHOD AND REAGENT FOR THE DETERMINATION OF CREATINE KINASE MB
4334023 - PROCESS FOR OBTAINING CHOLESTEROL OXIDASE
4334903 - PROCESS FOR OBTAINING CHOLESTEROL ESTERASE FROM MICRO-ORGANISMS
4360596 - PROCESS FOR THE PREPARATION OF CHOLESTEROL ESTERASE
4366249 - STORAGE STABLE CHOLESTEROL OXIDASE COMPOSITIONS

COLLABORATIVE RESEARCH, INCORPORATED

4342826 - IMMUNODASSAY PRODUCTS AND METHODS

COMPANIA ESPANOLA DE PETROLEOS, S.A.

4351903 - PROCESS FOR OBTAINING GLUCOSE-ISOMERASE

CORNELL RESEARCH FOUNDATION INC.

4335210 - METHOD OF PRODUCING L-CYSTEINE
4348479 - RECOVERY OF PROTEINACEOUS MATERIAL HAVING REDUCED NUCLEIC ACID LEVELS

CORNING GLASS WORKS

4350659 - STABILIZATION OF SENSITIVE BIOLOGICALLY ACTIVE INTERMEDIATE METABOLITES SUCH AS FOLIC ACID DERIVATIVES

CPC INTERNATIONAL INC.

4309505 - PROCESS FOR THE PRODUCTION OF FRUCTOSE TRANSFERASE ENZYME
4343902 - PRODUCTION OF IMMOBILIZED GLUCOSE ISOMERASE

DAINIPPON PHARMACEUTICAL CO. LTD.

4364926 - NOVEL ALKALINE PROTEASE M/3 \ METHOD FOR THE PREPARATION THEREOF AND DENTAL CARIES-PROPHYLACTIC COMPOSITION CO
- NAINING THE SAME

ORGANIZATIONAL PATENTING

DE FORENEDE BRYGERIER A/S

4340675 - PROCESS FOR RECOVERING CU,ZN-SUPEROXIDE DISMUTASE FROM YEAST
 4341867 - PROCESS FOR RECOVERING ENZYMES FROM BLOOD

EASTMAN KODAK COMPANY

4322496 - INHIBITION OF LACTATE OXIDASE

ELI LILLY AND COMPANY

4316955 - ENZYMATIC DEESTERIFICATION OF CEPHALOSPORIN METHYL ESTERS

ENZYME CENTER, INC.

4330626 - METHOD OF PREPARING HIGH-ACTIVITY, LOW-BACTERIA, UREASE ENZYME

FUJIZOKI PHARMACEUTICAL CO., LTD.

4346174 - PROCESS FOR ISOLATING SUPEROXIDE DISMUTASE FROM RED BLOOD CELLS

GREEN CROSS CORPORATION

4313938 - INTERFERON INDUCER AND METHOD OF PREPARING SAME
 4361652 - METHOD FOR STABILIZING PLASMINOGEN
 4361653 - PLASMINOGEN PREPARATIONS

IMPERIAL CHEMICAL INDUSTRIES LIMITED

4323649 - BIDTRANSFORMATIONS USING METHANE-UTILIZING BACTERIA

INSTITUTE FO MICROBIOLOGIA

4317883 - METHOD FOR OBTAINING OF GLUCOSE ISOMERASE
 4348481 - METHOD OF OBTAINING GLUCOSE ISOMERASE
 KABUSHIKI KAISHA HAYASHIBARA SEIBUTSU KAGAKU KENKYUJO
 4338398 - IMMOBILIZATION OF STARCH DEGRADING ENZYMES

KERNFORSCHUNGSANLAGE JULICH GMBH

4350767 - METHOD FOR ISOLATING AND PURIFYING ENZYMES FROM A CRUDE ENZYME SOLUTION

KYOWA HAKKO KOGYO CO., LTD.

4325413 - PROCESS FOR THE PREPARATION OF GALACTOSE OXIDASE
 4341868 - METHOD AND TEST COMPOSITION FOR THE DETERMINATION OF THE SUBSTRATE FOR XANTHINE OXIDASE

LEAF PROTEINS, INC.

4347324 - PROCESS FOR ISOLATION OF PROTEINS FROM PLANT LEAVES

LIFELINE PRODUCTS, INC.

4318989 - STARCH-DEGRADING ENZYMES FROM +1 CLADOSPORIUM RESINAE

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

4332899 - PROCESS FOR PRODUCING MALTASE
 4341869 - PROCESS FOR PRODUCING HEPARINASE
 4357422 - METHOD OF ENHANCING INTERFERON PRODUCTION

MAX-PLANCK-GESellschaft ZUR FÖRDERUNG DER WISSENSCHAFTEN E.V.

4331764 - SEMINAL PLASMA RIBONUCLEASE AND METHOD FOR ITS RECOVERY

MEDAC Gesellschaft für klinische Spezialpräparate mbH

4347311 - ENZYME IMMUNOASSAY FOR DETERMINING ANTIGEN SPECIFIC ANTIBODIES AND TEST KIT FOR CARRYING OUT THIS ASSAY

ORGANIZATIONAL PATENTING

MERCK & CO., INC.

4335101 - ORAL HYGIENE ENZYMES AND METHOD FOR PREPARATION

MILLES LABORATORIES INC.

4310626 - INTERFERENCE-RESISTANT COMPOSITION, DEVICE AND METHOD FOR DETERMINING A PEROXIDATIVELY ACTIVE SUBSTANCE IN A T

EST SAMPLE

4318980 - HETEROGENOUS SPECIFIC BINDING ASSAY EMPLOYING A CYCLING REACTANT AS LABEL

4318982 - FAD-LABELLED SPECIFIC BINDING ASSAY

4318983 - FAD-LABELLED SPECIFIC BINDING ASSAY MONITORED WITH APOGLUTATHIONE REDUCTASE OR APOGLUTATHIONE DEHYDROGENASE

4331590 - +62 - GALACTOSYL-UMBELLIFERONE-LABELLED PROTEIN AND POLYPEPTIDE CONJUGATES

4340668 - HEME-LABELLED SPECIFIC BINDING ASSAY

4348480 - PROCESS FOR PRODUCING GLUCOSE ISOMERASE

4348482 - NOVEL STRAIN OF +1 BACILLUS LICHENIFORMIS \ USEFUL IN THE PRODUCTION OF GLUCOSE ISOMERASE AND METHOD OF SCREEN

4355103 - NOVEL BACILLUS STRAIN FOR STABILITY OF GLUCOSE ISOMERASE IN THE ABSENCE OF XYLOSE

4355105 - NOVEL BACILLUS STRAIN FOR STABILITY OF GLUCOSE ISOMERASE IN THE ABSENCE OF XYLOSE

4362818 - ACYLATION OF +1 MUCOR PUTILLUS +B MICROBIAL RENNET ENZYME

4366243 - STABILIZATION OF GLUCOSE OXIDASE APOENZYME

MILLER BREWING COMPANY

4355047 - METHOD OF PREPARING A LOW CALORIE BEER

4355110 - PREPARATION OF OEBRANCHING ENZYME FROM RICE FOR PRODUCING A LOW CALORIE BEER

MITSUBISHI GAS-CHEMICAL COMPANY, INC.

4328312 - PROCESS FOR PRODUCTION OF PEROXIDASE

MITSUBISHI PETROCHEMICAL CO., LTD.

4319988 - THERMOPHILIC COLLAGENASES, THERMOPHILIC BACTERIA CAPABLE OF PRODUCING THERMOPHILIC COLLAGENASES, AND PROCESS F

4326029 - PROCESS FOR PRODUCTION OF L-ASPARTIC ACID

MITSUI TOATSU CHEMICALS INC.

4335209 - PROCESS FOR PREPARATION OF L-TRYPTOPHAN BY ENZYME

NABISCO, INC.

4347322 - CHROMATOGRAPHIC PROCESS FOR ENZYME PURIFICATION

NATIONAL RESEARCH DEVELOPMENT CORPORATION

4332895 - THERMAL STABLE BETA-GALACTOSIDASE

NIPPON SODA COMPANY LIMITED

4321363 - ADSORBENT FOR URONINASE CONTAINING AGAROSE

NITTO CHEMICAL INDUSTRY CO., LTD.

4343899 - PROCESS FOR PRODUCING STABLE AQUEOUS SOLUTION OF ACRYLAMIDE OR METHACRYLAMIDE

NOVO INDUSTRI A/S

4357357 - THERMAL DESTABILIZATION OF MICROBIAL RENNET

PFIZER INC.

4328429 - LACTASE PREPARATION

PHARMACIA DIAGNOSTICS AB

4337309 - METHOD OF DETERMINING THE CONCENTRATION OF PANCREATIC AND SALIVARY +60 -AMYLASE IN BODY FLUIDS

PRESIDENT AND FELLOWS OF HARVARD COLLEGE

4336336 - FUSED GENE AND METHOD OF MAKING AND USING SAME

- BIOTECHNOLOGY 1982 UPDATE - ENZYMES PER SE
ORGANIZATIONAL PATENTING
- PUBLIC HEALTH LABORATORY SERVICE, CENTER FOR APPLIED MICROBIO
4342827 - PRODUCTION OF ENZYMES
- RESEARCH CORPORATION
4347243 - ACID SOLUBLE, PEPSIN RESISTANT PLATELET AGGREGATING MATERIAL
- RESEARCH TRIANGLE INSTITUTE
4347312 - DETECTION OF ANTIBIOTICS IN MILK
- R. J. REYNOLDS TOBACCO COMPANY
4323651 - THERMOSTABLE LACTASE DERIVED FROM BACILLUS
- SANRAKU-OCEAN CO., LTD.
4317881 - PROCESS FOR PRODUCING CYCLODEXTRINS
- SLOAN-KETTERING INSTITUTE FOR CANCER RESEARCH
4333734 - DIAGNOSTIC DEVICE FOR FECAL OCCULT BLOOD AND METHOD OF USE
- STANDARO BRANOS INCORPORATED
4321323 - CARBOHYDRATE PROCESS
4321324 - PROCESS FOR MAKING GLUCOSE
- SYVA COMPANY
4318846 - NOVEL ETHER SUBSTITUTED FLUORESCIN POLYAMINO ACID COMPOUNDS AS FLUORESCERS AND QUENCHERS
4328311 - ENZYME-AMINOGLYCOSIDE CONJUGATES
4341866 - ANTIENTZYME TERMINATION IN ENZYME IMMUNOASSAYS
4351760 - NOVEL ALKYL SUBSTITUTED FLUORESCENT COMPOUNDS AND POLYAMINO ACID CONJUGATES
- TAKEDA CHEMICAL INDUSTRIES LTD.
4312943 - METHOD FOR ENZYME IMMUNOASSAY OF PANCREATIC GLUCAGON
- TECHNICON INSTRUMENTS CORPORATION
4339533 - STABILIZATION OF CREATINE KINASE (CK) AND ITS APPLICATION AS A REFERENCE STANDARD
- TOYO JOZO COMPANY, LTD.
4331763 - PROCESS FOR PRODUCTION OF ASCORBATE OXIDASE
4346173 - PROCESS FOR THE PRODUCTION OF ACYL-COENZYME A OXIDASE
4347323 - GLYCEROL KINASE FROM *STREPTOMYCES CANUS*
4357425 - PROCESS FOR PRODUCING L-AMINO ACID OXIDASE
- UNITED KINGDOM ATOMIC ENERGY AUTHORITY
4318990 - SEPARATION OF PROTEASES FROM FLUIDS
- UNITED STATES OF AMERICA, NAVY
4328313 - METHOD OF PRODUCING A PLAQUE DISPERSING ENZYME
- UNITIKA LTD.
4347322 - *STREPTOMYCES* OXIDASE
4349631 - PROCESS FOR PRODUCING HEAT-RESISTANT ACETATE KINASE
- UNIVERSITY OF MIAMI
4323647 - STERIC HINDRANCE ENZYME IMMUNOASSAY
- UNIVERSITY OF SOUTHERN CALIFORNIA
4311790 - RADIOENZYMATIC METHOD FOR ASSAYING 3,4-DIHYDROXYPHENYLGlyCOL

UNIVERSITY PATENTS, INC.

4340676 - METHOD OF CRYSTALLIZING RIBULOSE. 1,5-BISPHOSPHATE CARBOXYLASE/DXYGENASE FROM PHOTOSYNTHETIC ORGANISMS, PARTIALY LEAFY PLANT LEAVES

WISCONSIN ALUMNI RESEARCH FOUNDATION

4330621 - ASSAY FOR AMINOGLYCOSIDES
4352885 - PREPARATION OF A NOVEL NADP LINKED ALCOHOL-ALDEHYDE/KETONE DIOXIDOREDUCTASE FROM THERMOPHILIC ANAEROBIC BACTERIA FOR ANALYTICAL AND COMMERCIAL USE

YAMASU SHOUYU KABUSHIKI KAISHA

4350761 - METHOD OF AND REAGENTS FOR QUANTITATIVE ANALYSIS OF CYCLIC NUCLEOTIDES

YELLOW SPRINGS INSTRUMENT COMPANY, INC.

4356074 - SUBSTRATE SPECIFIC GALACTOSE OXIDASE ENZYME ELECTRODES

BIOTECHNOLOGY 1982 UPDATE - ENZYMES PER SE

INVENTOR NAME		INVENTORS OF INDIVIDUALLY OWNED PATENTS		(ALPHA LISTING)	
		STREET		CITY	
BERNSTEIN	LARRY H.	2800 GASLIGHT LA., EAST		MOBILE	
4311791	- AUTOMATED KINETIC DETERMINATION OF LACTATE DEHYDROGENASE ISoenzymes IN SERUM				
COLE	MORTON S.	2506 IVY LA.		DECATUR	
4320151	- ANTISTALING BAKING COMPOSITION				
GUGGENHEIM	BERNHARD	25 ALFRED-ESCHERSTRASSE		ZURICH	
4353881	- MUTANASE				
HUCK	JOHN C.	4020 28TH PL.		SEATTLE	
4329430	- ENZYME MIXTURE				
JDHAL	SARJIT	1411 S. 11TH ST. +190.2		LINCOLN	
4334024	- PREPARATION AND CRYSTALLIZATION OF FRACTION I PROTEIN FROM PLANT SOURCES				
KIYASU	JOHN Y.	94 MEADOW ST.		GARDEN CITY	
4338396	- HEART ATTACK SCREENING METHOD AND PROCESS				
KLEIN	GEROLD K.	MEREDITH RD.		BRUNSWICK	
4329430	- ENZYME MIXTURE				
MAXIMENKO	ALEXANDR V.	ULITSA BALTIISSKAYA, 10, KORPUS		MOSCOW	
4349630	- HEAT-RESISTANT WATER SOLUBLE UROKINASE DERIVATIVE				
MORRISCH	IVAN E.	1043 MESA DR.		CAMARILLO	
4310624	- STABILIZED LIQUID COENZYME COMPOSITIONS FOR DIAGNOSTIC DETERMINATIONS				
MORRISCH	IVAN E.	591 BEVERLY DR.		CAMARILLO	
4310625	- STABILIZED LIQUID ENZYME COMPOSITIONS FOR DIAGNOSTIC DETERMINATIONS				
MUHELMANN	HANS-RUDOLF	8 BEUSTWEG		ZURICH	
4353881	- MUTANASE				

BIOTECHNOLOGY 1982 UPDATE - IMMOBILIZED ENZYMES

PAGE A 1

1980-82 AVERAGES

PERCENT GROWTH	35.46
PERCENT FOREIGN	53.37
PERCENT CORPORATE OWNED	90.45
PERCENT GOVERNMENT OWNED	6.18
PERCENT U.S. OWNED OF FOREIGN	11.58
1980-82 XR/OR	3.45

DEFINITIONS

PERCENT GROWTH = 1980-82 PATENTS/1973-82 PATENTS X 100.

PERCENT FOREIGN = 1980-82 U.S. PATENTS WITH A FOREIGN RESIDENT INVENTOR/1980-82 PATENTS X 100

PERCENT CORPORATE OWNED = 1980-82 U.S. PATENTS ASSIGNED TO CORPORATIONS/1980-82 PATENTS X 100.

PERCENT GOVERNMENT OWNED = 1980-82 U.S. PATENTS ASSIGNED TO THE U.S. AND FOREIGN GOVERNMENTS/1980-82 PATENTS X 100.

PERCENT U.S. OWNED OF FOREIGN = 1980-82 U.S. PATENTS WITH A FOREIGN RESIDENT INVENTOR THAT ARE ASSIGNED TO A U.S. ORGANIZATION/1980-82 U.S. PATENTS WITH A FOREIGN RESIDENT INVENTOR X 100.

1980-82 XR/OR = 1980-82 U.S. PATENTS WITH A CROSS REFERENCE DESIGNATION/1980-82 U.S. PATENTS WITH AN ORIGINAL PRIMARY DESIGNATION.

BIOTECHNOLOGY 1982 UPDATE - IMMobilized ENZYMES

PATENT ACTIVITY (1/63-12/82) BY DATE OF PATENT GRANT

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	63-68	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	TOTAL
TOTAL ORIGIN	13	2	6	14	26	28	59	44	59	49	51	34	59	57	52	563
U.S. ORIGIN	7	7	6	8	14	18	36	22	31	21	23	17	29	29	27	283
FOREIGN ORIGIN	6	2	6	5	12	10	21	22	28	28	28	17	32	38	25	269
JAPAN	2															
UNITED KINGDOM				3	4	2	3	7	11	4	10	7	12	18	7	84
WEST GERMANY	1			1		3	3	2	4	3	5	2	3	2	7	47
FRANCE				1		3	3	2	2	4	3	2	8	8	3	43
SWEDEN					1	1	4	1	2	5	1	2	4	4	2	20
IRELAND					1				2	3	1	1			1	13
ISRAEL	2						1		1	1	4	1				11
CZECHOSLOVAKIA	1			1	3			1	1	1	2	1		1		11
ITALY						1			1	1	2			1	1	6
DENMARK								1	1	1	1			2	2	6
NETHERLANDS					1	1	1	1	1	1			1			6
AUSTRALIA					1											2
CANADA												1				1
NETHERLANDS																2
BEIGIUM																2
HUNGARY																2
U.S.S.R.								1							1	1
AUSTRIA																1
U.S. ORIGIN OWNED	7	2	6	9	14	18	38	22	31	24	23	17	27	28	27	284
U.S. CORP. OWNED	5	1	4	9	12	14	34	20	29	19	16	16	29	26	27	285
U.S. INDIV. OWNED	2		1		1	3	3	1	1	4	2	2	1	1	1	17
FOREIGN OWNED		1	1			1										21
FOREIGN ORIGIN	6			5	12	10	21	22	28	25	28	17	32	38	25	269
U.S. OWNED				1	4			1	2	2	2	1	5	5	1	22
FOREIGN OWNED	6			4	8	10	21	21	26	25	26	16	27	33	24	247
FOREIGN GOVT.	3			4	8	8	20	19	19	22	24	16	25	30	17	215
FOREIGN INDIV.	3					2	1	2	5	3	1		2	2	5	12
														1	2	20

BIOTECHNOLOGY 1982 UPDATE - IMMOBILIZED ENZYMES

PATENT ACTIVITY (PATENTS GRANTED 1/67-12/82) BY DATE OF PATENT APPLICATION

		NUMBER OF PATENTED APPLICATIONS														PAGE A 4	
		PRE 69	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	TOTAL
TOTAL	ORIGIN	30	11	23	23	44	57	55	41	55	54	54	58	41	6	552	
U.S.		22	5	13	14	26	34	26	19	31	26	23	25	20	4	288	
FOREIGN	ORIGIN	8	6	10	9	18	23	29	22	24	28	31	33	21	2	264	
JAPAN		1	2	1	1	2	7	9	7	7	13	10	13	9	1	83	
UNITED KINGDOM		4	1	4	2	8	4	5	3	3	2	2	6	3		47	
WEST GERMANY				2	2	3	6	1	3	2	6	9	4	4		42	
FRANCE						2	3	3	3	3	2	4	2	1		40	
SWEDEN					2		1	3	4	1	3	2	1			17	
SWITZERLAND					1	1	1	1	1	4	3	2	1			13	
ISRAEL		3	1	1			1	2	1	1			1			9	
CZECHOSLOVAKIA								1	1				2			5	
NETHERLANDS								1	1	2	1		2	1	1	6	
DENMARK		1					1	1		1			1			6	
AUSTRALIA			1	1	1			1	1				1			6	
CANADA																2	
BELGIUM																2	
HUNGARY																2	
U.S.S.R.						1	1	1	1	1	1	1	1	1	1	2	
AUSTRIA													2	2		9	
U.S. ORIGIN OWNED		22	5	13	14	26	34	26	19	31	26	23	25	20	4	288	
U.S. CORP. OWNED		18	5	10	12	23	32	23	14	24	19	20	23	20	4	247	
U.S. INDIV. OWNED		2		3	1	2	1	2	4	5	3	2	2	1		19	
FOREIGN OWNED		2			1		2	2	4	2	2	1	2			5	
FOREIGN ORIGIN		8	6	10	9	18	23	29	22	24	28	31	33	21	2	264	
U.S. OWNED		2	2	1												22	
FOREIGN OWNED		6	4	9	9	18	22	28	21	22	25	29	27	20	2	242	
FOREIGN CORP.		6	3	9	8	16	19	24	16	21	23	28	22	16	2	213	
FOREIGN GOVT.																12	
FOREIGN INDIV.			1	1	1	2	3	2	4	1	1	1	5	1	3	17	

ORGANIZATIONAL PATENTING

AGENCY OF INDUSTRIAL SCIENCE & TECHNOLOGY
4332904 - BIOCHEMICAL TREATMENT BY MICROORGANIC METHOD

AIRCO INC.
4317879 - GLUCOSE ANALYZER MEMBRANE CONTAINING IMMOBILIZED GLUCOSE OXIDASE

AKZOMA INCORPORATED
4341112 - GLASS SUPPORT COATED WITH SYNTHETIC POLYMER FOR BIOPROCESS
4362634 - GLASS SUPPORT COATED WITH SYNTHETIC POLYMER FOR BIOPROCESS

BATTELLE DEVELOPMENT CORPORATION
4327181 - AEROBIC SUBMERGED FERMENTATION OF SPORULATING, ECTOMYCORRHIZAL FUNGI

BETHESDA RESEARCH LABORATORY
4342833 - IMMOBILIZED RESTRICTION ENDONUCLEASES

CEKOSLOVENSKA AKADEMIE VEO
4332694 - THREE-DIMENSIONAL CARRIER OF INORGANIC POROUS MATERIAL-REACTIVE POLYMER AND A METHOD FOR ITS PREPARATION

COLLABORATIVE RESEARCH, INCORPORATED
4342826 - IMMUNODASSAY PRODUCTS AND METHODS

CORBIS LABORATORIES, INC.
4317810 - WAFFLE-LIKE MATRIX FOR IMMUNODASSAY AND PREPARATION THEREOF

CORNING GLASS WORKS
4321141 - METHOD FOR PROCESSING WASTE

CPC INTERNATIONAL INC.
4343902 - PRODUCTION OF IMMOBILIZED GLUCOSE ISOMERASE

CURATORS OF THE UNIVERSITY OF MISSOURI
4355108 - ETHANOL PRODUCTION WITH AN IMMOBILIZED CELL REACTOR

DAMON CORPORATION
4352883 - ENCAPSULATION OF BIOLOGICAL MATERIAL

DEGUSSA AKTIENGESELLSCHAFT
4328031 - PROCESS FOR THE CONTINUOUS ENZYMATIC CHANGE OF WATER SOLUBLE +60 -KETOCARBOXYLIC ACIDS INTO THE CORRESPONDING +80 -HYDROXYCARBOXYLIC ACIDS

DUKE UNIVERSITY INC.
4343715 - IMMOBILIZED HEMOGLOBIN, AND PROCESSES FOR EXTRACTING OXYGEN FROM FLUIDS USING THE SAME

GAMRO AG
4311789 - METHOD FOR SAMPLING AND MEASURING THE CONTENT OF A LOW-MOLECULAR WEIGHT COMPOUND IN A COMPLEX FLUID MEDIUM

GIST-BROCADES N.V.
4320194 - PROCESS FOR THE PRODUCTION OF CARRIER PARTICLES FROM YEAST CELLS AND FOR PRODUCING DIAGNOSTIC AGENTS THEREFROM
AND TEST KITS CONTAINING SUCH AGENTS

INSTITUT NATIONAL DE LA SANTE ET DE LA RECHERCHE MEDICALE
4355102 - AGGLUTINATION TESTS FOR DETECTING INFLUENZA VIRUSES, AND REAGENTS FOR CARRYING OUT THESE TESTS
ITALFARMACO S.P.A.
4338401 - IMMOBILIZATION OF ENZYMES

ORGANIZATIONAL PATENTING

KABUSHIKI KAISHA HAYASHIBARA SEIBUTSU KAGAKU KENKYUJO
4358398 - IMMOBILIZATION OF STARCH DEGRADING ENZYMES
KURARAY CO., LTD.

4352884 - CARRIER HAVING ACRYLATE COPOLYMER COATING FOR IMMOBILIZATION OF BIOACTIVE MATERIALS

MEGAC GESELLSCHAFT FUR KLINISCHE SPEZIALPRAPARATE MBH
4347311 - ENZYME IMMUNOASSAY FOR DETERMINING ANTIGEN SPECIFIC ANTIBODIES AND TEST KIT FOR CARRYING OUT THIS ASSAY

MIDWEST RESEARCH INSTITUTE

4324858 - STABILIZATION OF CHOLINESTERASE, DETECTOR KIT USING STABILIZED CHOLINESTERASE, AND METHODS OF MAKING AND USING THE SAME

MILES LABORATORIES INC.

437313 - IMMOBILIZATION OF BIOCATALYSTS
437320 - IMMOBILIZATION OF MICROORGANISMS IN GELLED CARRAGEENAN
435105 - GLUTARALDEHYDE/POLYETHYLENIMINE IMMOBILIZATION OF WHOLE MICROBIAL CELLS

NABISCO, INC.

4347322 - CHROMATOGRAPHIC PROCESS FOR ENZYME PURIFICATION

NATIONAL RESEARCH DEVELOPMENT CORPORATION

4332895 - THERMAL STABLE BETA-GALACTOSIDASE

NIPPON MINING CO., LTD.

4359536 - PROCESS FOR THE PREPARATION OF LONG-CHAIN DICARBOXYLIC ACIDS BY FERMENTATION

NITTO CHEMICAL INDUSTRY CO., LTD.

4343900 - PROCESS FOR THE PRODUCTION OF ACRYLAMIDE USING MICROORGANISM

P C U K PRODUITS CHIMIQUES UGNE KUHLMANN

4318948 - PROCESS FOR BIOLOGICAL DENITRIFICATION OF EFFLUENTS

PURDUE RESEARCH FOUNDATION

4321327 - PREPARATION OF SPHERICAL SHAPED MYCELIAL PELLETS

RADEKIS ELEKTROKEMIAI MUSZERGYARTO SZOVETKEZET

4354913 - MOLECULE SELECTIVE ENZYME ELECTRODE

SORIN BIOMEDICA S.P.A.

4356267 - ENZYME IMMOBILIZATION IN CELLULOSIC HOLLOW FIBRES

STANDARD BRANDS, INCORPORATED

4321323 - CARBOHYDRATE PROCESS

4321324 - PROCESS FOR MAKING GLUCOSONE

SYVA COMPANY

4328311 - ENZYME-AMINOGLYCOSIDE CONJUGATES

TALRES DEVELOPMENT (N.A.) N.V.

4359531 - PRODUCTION OF ISOMALTULOSE

TANABE SEIYAKU CO. LTD.

4350765 - METHOD FOR PRODUCING ETHANOL WITH IMMOBILIZED MICROORGANISM

TECHNICON INSTRUMENTS CORPORATION

4338395 - METHOD FOR THE ANALYSIS OF TRIGLYCERIDES

BIOTECHNOLOGY 1982 UPDATE - IMMOBILIZED ENZYMES

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ORGANIZATIONAL PATENTING

UNITED KINGDOM
 432890 - ATOMIC ENERGY AUTHORITY
 432891 - SEPARATION OF PROTEASES FROM FLUIDS
 432892 - IMMOBILIZATION OF BIOLOGICALLY ACTIVE SUBSTANCES IN A POROUS SUPPORT
 432893 - COMPOSITE MATERIALS COMPRISING DEFORMABLE XEROGEL WITHIN THE PORES OF PARTICULATE RIGID SUPPORTS USEFUL IN CHR
 432894 - OMATOGRAPHY
 432895 - COMPOSITE MATERIALS COMPRISING DEFORMABLE XEROGEL WITHIN THE PORES OF PARTICULATE RIGID SUPPORTS USEFUL IN CHR
 432896 - OMATOGRAPHY

UDF, INC.
 4327172 - ENHANCED IMMOBILIZATION OF A GLUCOSE ISOMERASE
 4343901 - MAGNETIC SUPPORT MATRIX FOR ENZYME IMMOBILIZATION

WARNER-LAMBERT COMPANY
 4357311 - SUBSTRATE FOR IMMUNOASSAY AND MEANS OF PREPARING SAME
 WISCONSIN ALLIUMI RESEARCH FOUNDATION
 4310554 - PREPARATION OF CHEESE WITH MICROENCAPSULATED ENZYMES

W. R. GRACE & CO.
 4312946 - PREPARATION AND USE OF ENZYMES BOUND TO POLYURETHANE
 4342834 - ENZYMES BOUND TO POLYURETHANE

BIOTECHNOLOGY 1982 UPDATE - IMMOBILIZED ENZYMES

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INVENTORS OF INDIVIDUALLY OWNED PATENTS

(ALPHA LISTING)

INVENTOR NAME	STREET	CITY	ST	ZIP/CNTRY
KLEIN	JOACHIM	SCHAPENBRUCH 14	3300 BRAUNSCHWEIG	DE
4334027	PREPARATION OF IMMOBILIZED ENZYMATICALLY-ACTIVE SUBSTANCE			
MAXIMENKO	ALEXANDR V.	ULITSA BALTIISKAYA, 10, KORPUS	MOSCOW	SU
4349630	HEAT-RESISTANT WATER SOLUBLE UROKINASE DERIVATIVE			
WAGNER	FRITZ	HOFE WIESE 2	3300 BRAUNSCHWEIG-ST	DE
4334027	PREPARATION OF IMMOBILIZED ENZYMATICALLY-ACTIVE SUBSTANCE			

BIOTECHNOLOGY 1982 UPDATE - TISSUE CULTURE

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1980-82 AVERAGES

PERCENT GROWTH	42.68
PERCENT FOREIGN	24.76
PERCENT CORPORATE OWNED	80.00
PERCENT GOVERNMENT OWNED	6.67
PERCENT U.S. OWNED OF FOREIGN	15.38
1980-82 XR/OR	2.09

DEFINITIONS

PERCENT GROWTH = 1980-82 PATENTS/1973-82 PATENTS X 100.

PERCENT FOREIGN = 1980-82 U.S. PATENTS WITH A FOREIGN RESIDENT INVENTOR/1980-82 PATENTS X 100

PERCENT CORPORATE OWNED = 1980-82 U.S. PATENTS ASSIGNED TO CORPORATIONS/1980-82 PATENTS X 100.

PERCENT GOVERNMENT OWNED = 1980-82 U.S. PATENTS ASSIGNED TO THE U.S. AND FOREIGN GOVERNMENTS/1980-82 PATENTS X 100.

PERCENT U.S. OWNED OF FOREIGN = 1980-82 U.S. PATENTS WITH A FOREIGN RESIDENT INVENTOR THAT ARE ASSIGNED TO A U.S. ORGANIZATION/1980-82 U.S. PATENTS WITH A FOREIGN RESIDENT INVENTOR X 100.

1980-82 XR/OR = 1980-82 U.S. PATENTS WITH A CROSS REFERENCE DESIGNATION/1980-82 U.S. PATENTS WITH AN ORIGINAL PRIMARY DESIGNATION.

BIOTECHNOLOGY 1982 UPDATE - TISSUE CULTURE

PATENT ACTIVITY (1/63-12/82) BY DATE OF PATENT GRANT

		NUMBER OF PATENTS														PAGE A 2	
		63-68	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	TOTAL
TOTAL		25	8	7	8	8	17	17	26	20	32	17	12	36	29	40	302
U.S. ORIGIN		16	8	4	7	7	12	10	20	14	24	14	7	26	25	28	222
FOREIGN ORIGIN		9	3	3	1	1	5	7	6	6	8	3	5	10	4	12	80
UNITED KINGDOM		4	2	1	1	1	1	4	1	1	2	1	1	2	1	3	23
JAPAN		2	1	1	1	1	1	1	1	2	1	1	1	4	1	4	16
WEST GERMANY		2					1	1	1	1	1	1	1	1	2	1	10
FRANCE		1				1	1				4		1	1		2	7
CANADA		1				1	1	1	1	1	1		1	1	1	1	6
SWITZERLAND		1				1	1	1	1	1	1		1	1	1	1	5
AUSTRIA		1															3
CZECHOSLOVAKIA		1					1						1				1
ITALY																	1
INDIA							1					1					1
U.S. ORIGIN		16	8	4	7	7	12	10	20	14	24	14	7	26	25	28	222
U.S. CORP. OWNED		14	7	3	5	7	7	7	16	10	19	13	3	20	18	24	173
U.S. GOVT. OWNED		2	1	1	1	1	3	1	3	4	2	1	2	3	5	4	32
FOREIGN OWNED							1						1				2
FOREIGN ORIGIN		9	3	3	1	1	5	7	6	6	8	3	5	10	4	12	80
U.S. OWNED		1	1	1	1	1	2	2	2	2	1	2	1	2	1	2	14
FOREIGN OWNED		9	2	2	1	1	4	5	6	4	7	1	5	8	4	10	66
FOREIGN CORP.		6	2	2	1	1	2	3	5	4	6	1	5	8	2	9	54
FOREIGN GOVT.															1	1	1
FOREIGN INDIV.		3					2	2	1		1				1		11

BIOTECHNOLOGY 1982 UPDATE - TISSUE CULTURE

PATENT ACTIVITY (PATENTS GRANTED 1/67-12/82) BY DATE OF PATENT APPLICATION

	NUMBER OF PATENTED APPLICATIONS-														PAGE A 4	
	PRE 69	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	TOTAL
TOTAL	29	9	8	12	11	21	24	28	21	17	36	32	33	3		284
U.S. ORIGIN	21	6	5	10	8	13	21	20	14	10	27	26	25	3		209
FOREIGN ORIGIN	8	3	3	2	3	8	3	8	7	7	9	6	8			75
UNITED KINGDOM	4	1		1	1	2	2	1	2	2	1	2	2			21
FRANCE	2					1	1	1	3	1	4	2				16
WEST GERMANY	1		1	1	1	1	1	1	1	1	2		1			19
NETHERLANDS						1										7
FINLAND						1										7
CANADA						1		3	1	2						6
SWITZERLAND	1	2				1		1			1	1				4
SWEDEN					1	2		1								3
AUSTRIA						1										3
CZECHOSLOVAKIA										1	1	1				3
YUGOSLAVIA																1
INDIA			1													1
U.S. ORIGIN	21	6	5	10	8	13	21	20	14	10	27	26	25	3		209
U.S. CORP. OWNED	16	4	4	9	5	9	16	16	13	6	20	23	18	2		161
U.S. GOVT. OWNED	1			1	2	1	1	1	1	1	3	1	1			15
U.S. INDIV. OWNED	4	1	1			3	4	2	1	3	3	2	6	1		31
FOREIGN OWNED					1						1					2
FOREIGN ORIGIN	8	3	3	2	3	8	3	8	7	7	9	6	8			75
U.S. OWNED	2	1	1			1	1	2	2	1	1	1	2			14
U.S. CORP. OWNED	6	2	3	1	3	7	2	6	5	6	8	6	6			61
U.S. GOVT. OWNED																
FOREIGN OWNED	6	2	1	1	2	5	2	6	4	6	8	5	4			52
FOREIGN ORIGIN																
FOREIGN CORP. OWNED																
FOREIGN GOVT. OWNED																
FOREIGN INDIV. OWNED			2		1	2			1			1	2			8

BIOTECHNOLOGY 1982 UPDATE - TISSUE CULTURE

ORGANIZATIONAL PATENTING

ALBERT EINSTEIN COLLEGE OF MEDICINE OF YESHIVA UNIVERSITY
4326027 - ANTIGLOBULIN CONTROL CELLS
4352887 - METHOD AND ARTICLE FOR CULTURING DIFFERENTIATED CELLS

ASAHI KASEI KOGYO KABUSHIKI KAISHA
4317882 - PRODUCTION OF PLASMINOGEN ACTIVATOR
4328314 - PROCESS FOR PRODUCING PLASMINOGEN ACTIVATOR
BECTON, DICKINSON AND COMPANY
431886 - METHOD FOR SURFACE ROLLER BOTTLE
4320302 - METHOD FOR SURFACE ROLLER BOTTLE
4337104 - METHOD FOR MANUFACTURING A ROLLER BOTTLE

BRISTOL-MYERS COMPANY
4350768 - METHOD FOR PREPARING SINGLE CELL SUSPENSION

BRITISH PETROLEUM COMPANY LIMITED
4326034 - FERMENTATION PROCESS FOR PRODUCING HIGHER PLANT CELLS

CHEMAP AG
4310630 - ARRANGEMENT FOR CULTIVATING CELLS OF ANIMAL AND HUMAN TISSUES
4311798 - METHOD OF AND AN ARRANGEMENT FOR CULTIVATING CELLS OF ANIMAL AND HUMAN TISSUES

DANON CORPORATION
4352883 - ENCAPSULATION OF BIOLOGICAL MATERIAL

DATA PACKAGING CORPORATION
4349632 - TISSUE CULTURE CLUSTER DISK

G. D. SEARLE & CO.
4343904 - PROCESS AND APPARATUS FOR GROWING ANIMAL CELLS
INTERNATIONAL INSTITUTE OF DIFFERENTIATION LIMITED
4316962 - NOVEL CELL LINE

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
4352880 - DIFFUSION BIOASSAY FOR THE QUANTITATIVE DETERMINATION OF MUTAGENICITY
4357422 - METHOD OF ENHANCING INTERFERON PRODUCTION

MONSANTO COMPANY
4335215 - METHOD OF GROWING ANCHORAGE-DEPENDENT CELLS

MORINAGA MILK INDUSTRY CO., LTD.
4342828 - METHOD FOR PRODUCING SUBSTANCE CAPABLE OF STIMULATING DIFFERENTIATION AND PROLIFERATION OF HUMAN GRANULOPOTENTI C-STEM CELLS

NATIONAL RESEARCH DEVELOPMENT CORPORATION
4350683 - ANTIBODY PRODUCTION FROM HYBRID CELL LINE

OLYMPUS OPTICAL CO., LTD.
4339537 - METHOD OF CULTURING BIOLOGICAL SUBSTANCES

ORTHO PHARMACEUTICAL CORPORATION
4361549 - COMPLEMENT-FIXING MONOCLONAL ANTIBODY TO HUMAN T CELLS, AND METHODS OF PREPARING SAME
4361550 - COMPLEMENT-FIXING MONOCLONAL ANTIBODY TO HUMAN SUPPRESSOR T CELLS AND METHODS OF PREPARING SAME
4363799 - MONOCLONAL ANTIBODY TO HUMAN T CELLS, AND METHODS FOR PREPARING SAME
4364932 - MONOCLONAL ANTIBODY TO HUMAN CYTOTOXIC AND SUPPRESSOR T CELLS AND METHODS OF PREPARING SAME

BIOTECHNOLOGY 1982 UPDATE - TISSUE CULTURE
ORGANIZATIONAL PATENTING

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ORTHO PHARMACEUTICAL CORPORATION
4364933 - MONOCLONAL ANTIBODY TO A HUMAN THYMOCYTE ANTIGEN AND METHODS OF PREPARING SAME (CONTINUED)
4364935 - MONOCLONAL ANTIBODY TO A HUMAN PROTHYMOCYTE ANTIGEN AND METHODS OF PREPARING SAME
4364936 - MONOCLONAL ANTIBODY TO A HUMAN MONOCYTE ANTIGEN AND METHODS OF PREPARING SAME
4364937 - MONOCLONAL ANTIBODY TO A HUMAN T CELL ANTIGEN AND METHODS OF PREPARING SAME
REGENTS OF UNIVERSITY OF CALIFORNIA
4323555 - METHOD OF PROTECTING CATTLE AND SHEEP AGAINST BOVINE LEUKEMIA VIRUS AND VACCINES FOR USE THEREIN
4326026 - METHOD FOR FRACTIONATING CELLS
RESEARCH CORPORATION
4350687 - PLATELET DERIVED CELL GROWTH FACTOR
RUSH-PRESBYTERIAN-ST. LUKE'S MEDICAL CENTER
4356261 - ANTI-INVASION FACTOR CONTAINING CULTURES
UNITED STATES OF DEPARTMENT OF HEALTH & HUMAN SERVICES
4328309 - METHOD FOR PRODUCING TRIPTOLIDE, TRIPTOLIDE AND CELASTROL
WISTAR INSTITUTE
4334016 - HUMAN OSTEOGENIC SARCOMA CELL LINE AND USE THEREOF FOR IMMUNOFLOUORESCENT ANTIBODY TEST

BIOTECHNOLOGY 1982 UPDATE - TISSUE CULTURE

PAGE D 1

INVENTORS OF INDIVIDUALLY OWNED PATENTS		(ALPHA LISTING)	
INVENTOR NAME	STREET	CITY	ST ZIP/CNTRY
BAKER 4321330 - TISSUE CULTURE DEVICE	FRASER L.	LOS ANGELES	CA 90048
CARVER 4334028 - FLASK	JOSEPH L.	NEWPORT BEACH	CA 92663
ROSENBERG 4332893 - PROCESS FOR THE PRODUCTION OF AN INSULIN-PRODUCING CELL LINE OF PANCREATIC BETA CELLS	RALPH A.	124 JOHNSON ST., APT. 1-B HIGHLAND PARK	NJ 08904
SEFTON 4353888 - ENCAPSULATION OF LIVE ANIMAL CELLS	MICHAEL V.	21 PRINCE CHARLES DR.	CA
SONG 4356908 - PLANT CULTURE VESSEL	JOHN S.	2827 SHERIDAN PL. EVANSTON	IL 60201

1980-82 AVERAGES

PERCENT GROWTH	35.77
PERCENT FOREIGN	41.94
PERCENT CORPORATE OWNED	98.92
PERCENT GOVERNMENT OWNED	0.00
PERCENT U.S. OWNED OF FOREIGN	25.64
1980-82 XR/OR	1.38

DEFINITIONS

PERCENT GROWTH = 1980-82 PATENTS/1973-82 PATENTS X 100.

PERCENT FOREIGN = 1980-82 U.S. PATENTS WITH A FOREIGN RESIDENT INVENTOR/1980-82 PATENTS X 100

PERCENT CORPORATE OWNED = 1980-82 U.S. PATENTS ASSIGNED TO CORPORATIONS/1980-82 PATENTS X 100.

PERCENT GOVERNMENT OWNED = 1980-82 U.S. PATENTS ASSIGNED TO THE U.S. AND FOREIGN GOVERNMENTS/1980-82 PATENTS X 100.

PERCENT U.S. OWNED OF FOREIGN = 1980-82 U.S. PATENTS WITH A FOREIGN RESIDENT INVENTOR THAT ARE ASSIGNED TO A U.S. ORGANIZATION/1980-82 U.S. PATENTS WITH A FOREIGN RESIDENT INVENTOR X 100.

1980-82 XR/OR = 1980-82 U.S. PATENTS WITH A CROSS REFERENCE DESIGNATION/1980-82 U.S. PATENTS WITH AN ORIGINAL PRIMARY DESIGNATION.

PATENT ACTIVITY (1/63-12/82) BY DATE OF PATENT GRANT

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BIOTECHNOLOGY 1982 UPDATE -- STARCH HYDROLYSATES

PATENT ACTIVITY (PATENTS GRANTED 1/67-12/82) BY DATE OF PATENT APPLICATION

		NUMBER OF PATENTED APPLICATIONS														PAGE A 4	
		PRE 69	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	TOTAL
TOTAL		54	24	21	21	16	24	31	25	24	20	18	32	27	5		342
U.S. ORIGIN		43	10	9	11	8	14	16	14	16	11	8	18	18	3		199
FOREIGN ORIGIN		11	14	12	10	8	10	15	11	8	9	10	14	9	2		143
JAPAN		9	11	10	9	6	2	9	7	2	4	2	8	5	2		86
UNITED KINGDOM		2	2	1	2	2	2	1	2	1	1	1	1	1			14
FRANCE																	1
GERMANY		2															8
FINLAND																	8
DENMARK		1					2	1	1	1	1	1	1	1			8
BELGIUM																	7
SWEDEN								1	1	1	2	2	2				3
SWITZERLAND										2							2
AUSTRALIA										1							1
AUSTRIA																	1
ISRAEL																	1
ITALY																	1
NETHERLANDS																	1
CANADA																	1
EAST GERMANY							1										1
U.S. ORIGIN OWNED		43	10	9	11	8	14	16	14	16	11	8	18	18	3		199
U.S. CORP. OWNED		39	10	8	9	7	14	14	10	12	11	8	18	17	3		181
U.S. INDIV. OWNED		1		1	1			1		2							6
FOREIGN OWNED		2		1	1	1			2	1				1			9
FOREIGN ORIGIN		11	14	12	10	8	10	15	11	8	9	10	14	9	2		143
U.S. OWNED		1	2						2	1							19
FOREIGN OWNED		10	12	12	10	8	10	13	8	7	9	8	7	8	2		124
FOREIGN CORP.		8	11	12	10	7	9	13	8	5	9	8	7	8	2		117
FOREIGN GOVT.																	
FOREIGN INDIV.		2	1		1	1	1			2							7

BIOTECHNOLOGY 1982 UPDATE - STARCH HYDROLYSATES

ORGANIZATIONAL PATENTING

A. E. STALEY MANUFACTURING COMPANY
4310628 - FRUCTOSE PRODUCTION

ALUMINUM COMPANY OF AMERICA

4359532 - METHOD FOR GLUCOSE EXTRACTION FROM GREEN CROPS

BIO RESEARCH CENTER CO., LTD.

4314854 - METHOD FOR THE TREATMENT OF CELLULOSIC SUBSTANCES WITH HYDROGEN PEROXIDE

CPC INTERNATIONAL INC.

4317880 - PROCESS FOR THE PRODUCTION OF FRUCTOSE POLYMERS AND HIGH FRUCTOSE SYRUPS
4395207 - PROCESS FOR THE PRODUCTION OF HIGH FRUCTOSE SYRUPS AND ETHANOL
4348902 - PRODUCTION OF IMMOBILIZED GLUCOSE ISOMERASE
4356462 - PROCESS FOR THE PRODUCTION OF HIGH FRUCTOSE SYRUPS AND ETHANOL

KABUSHIKI KAISHA HAYASHIBARA SEIBUTSU KAGAKU KENKYUJO

4338398 - IMMOBILIZATION OF STARCH DEGRADING ENZYMES

MERCK & CO., INC.

4340673 - PROCESS OF PRODUCING MODIFIED GLUCANS AS ANTI-CARIES AGENT

MILES LABORATORIES INC.

348480 - PROCESS FOR PRODUCING GLUCOSE ISOMERASE
4395103 - NOVEL STRAIN OF *†* BACILLUS LICHENIFORMIS \ USEFUL IN THE PRODUCTION OF GLUCOSE ISOMERASE AND METHOD OF SCREENING BACILLUS MUTANTS FOR ABILITY TO PRODUCE GLUCOSE ISOMERASE IN THE ABSENCE OF XYLULOSE
4355105 - GLUTARALDEHYDE/POLYETHYLENIMINE IMMOBILIZATION OF WHOLE MICROBIAL CELLS

NATIONAL DISTILLERS AND CHEMICAL CORPORATION

4315625 - METHOD OF REFINING GLUCOSYL STARCH SYRUP FOLLOWED BY SACCHARIFICATION WITH ION EXCHANGE RESIN
4356266 - PROCESS FOR THE HYDROLYSIS OF STARCH AND FERMENTABLE HYDROLYSATES OBTAINED THEREFROM

NATIONAL RESEARCH DEVELOPMENT CORPORATION

4332895 - THERMAL STABLE BETA-GALACTOSIDASE

NOVO INDUSTRI A/S

4316936 - FERMENTATION PROCESS
4395208 - SACCHARIFICATION OF STARCH HYDROLYSATES

PURDUE RESEARCH FOUNDATION

4332894 - CONVERSION OF GUAR GUM TO GEL-FORMING POLYSACCHARIDES BY THE ACTION OF *60 -GALACTOSIDASE

RICH PRODUCTS CORPORATION

4356195 - FRUIT JUICES HAVING A DEPRESSED FREEZING POINT

ROUQUETTE FRERES

4346116 - NON-CARIOGENIC HYDROGENATED STARCH HYDROLYSATE, PROCESS FOR THE PREPARATION AND APPLICATIONS OF THIS HYDROLYSATE

SANRAKU-OCEAN CO., LTD.

4317881 - PROCESS FOR PRODUCING CYCLODEXTRINS

STANDARD BRANDS, INCORPORATED

4321323 - CARBOHYDRATE PROCESS
4321324 - PROCESS FOR MAKING GLUCOSONE

STANDARD OIL COMPANY (INDIANA)

4338399 - PROCESS FOR RECOVERING HYDROCARBONS FROM HYDROCARBON-CONTAINING BIOMASS

BIOTECHNOLOGY 1982 UPDATE - STARCH HYDROLYSATES

ORGANIZATIONAL PATENTING

TALRES DEVELOPMENT (N.A.) N.V.
4359531 - PRODUCTION OF ISOMALTULOSE

TORAY INDUSTRIES INC.
4347316 - PROCESS FOR ISOMERIZING GLUCOSE TO FRUCTOSE

BIOTECHNOLOGY 1982 UPDATE - STARCH HYDROLYSATES

INVENTORS OF INDIVIDUALLY OWNED PATENTS

INVENTOR NAME

KEIM
4361651 - PROCESS FOR MAKING FERMENTABLE SUGARS AND HIGH-PROTEIN PRODUCTS

CARROLL
R.

STREET

50 GLENBROOK RD.

(ALPHA LISTING)

CITY

STAMFORD

ST ZIP/CNTRY

CT 06902

1980-82 AVERAGES

PERCENT GROWTH	27.60
PERCENT FOREIGN	75.47
PERCENT CORPORATE OWNED	92.45
PERCENT GOVERNMENT OWNED	0.00
PERCENT U.S. OWNED OF FOREIGN	5.00
1980-82 XR/OR	1.12

DEFINITIONS

PERCENT GROWTH = 1980-82 PATENTS/1973-82 PATENTS X 100.

PERCENT FOREIGN = 1980-82 U.S. PATENTS WITH A FOREIGN RESIDENT INVENTOR/1980-82 PATENTS X 100

PERCENT CORPORATE OWNED = 1980-82 U.S. PATENTS ASSIGNED TO CORPORATIONS/1980-82 PATENTS X 100.

PERCENT GOVERNMENT OWNED = 1980-82 U.S. PATENTS ASSIGNED TO THE U.S. AND FOREIGN GOVERNMENTS/1980-82 PATENTS X 100.

PERCENT U.S. OWNED OF FOREIGN = 1980-82 U.S. PATENTS WITH A FOREIGN RESIDENT INVENTOR THAT ARE ASSIGNED TO A U.S. ORGANIZATION/1980-82 U.S. PATENTS WITH A FOREIGN RESIDENT INVENTOR X 100.

1980-82 XR/OR = 1980-82 U.S. PATENTS WITH A CROSS REFERENCE DESIGNATION/1980-82 U.S. PATENTS WITH AN ORIGINAL PRIMARY DESIGNATION.

PATENT ACTIVITY (1/63-12/82) BY DATE OF PATENT GRANT

		63-68	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	TOTAL
TOTAL		77	11	18	23	37	26	30	38	15	13	14	3	17	18	18	358
U.S. ORIGIN		25	6	2	4	6	4	4	6	1	3	3	3	3	6	4	77
FOREIGN ORIGIN		52	5	16	19	31	22	26	32	14	10	11	3	14	12	14	281
JAPAN		47	5	14	19	28	22	22	28	7	5	9	2	10	5	10	233
WEST GERMANY		3				1		2	1		1				1		13
FRANCE		1		1		1				4			1	1			9
ITALY					1					1	2	1		1	1		8
UNITED KINGDOM		1							2	1	1			1	2		5
U.S.R.								1	1	1	1			1	2	1	5
NETHERLANDS												1					3
ISRAEL												1			1		2
ARGENTINA																	1
CANADA				1				1									1
U.S. ORIGIN OWNED		25	6	2	4	6	4	4	6	1	3	3		3	6	4	77
U.S. CORP. OWNED		25	6	2	4	6	4	3	6	1	2	3		3	6	4	75
U.S. GOVT. OWNED																	1
U.S. INDIV. OWNED											1						1
FOREIGN OWNED								1									
FOREIGN ORIGIN		52	5	16	19	31	22	26	32	14	10	11	3	14	12	14	281
U.S. OWNED		2		1				1						2			6
FOREIGN OWNED		50	5	15	19	31	22	25	32	14	10	11	3	12	12	14	275
FOREIGN CORP.		46	5	12	18	31	22	24	31	13	9	11	3	11	10	13	259
FOREIGN GOVT.		1								1							1
FOREIGN INDIV.		3		3	1			1	1	1	1			2	2	1	14

PATENT ACTIVITY (PATENTS GRANTED 1/67-12/82) BY DATE OF PATENT APPLICATION

		NUMBER OF PATENTED APPLICATIONS-															PAGE A. 4	
		PRE 69	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	TOTAL	
TOTAL		92	18	16	22	20	27	24	15	12	17	11	15	17	4		310	
U.S. ORIGIN		23	1	2	2	2	6	4	2	4	3	4	3	3	1		59	
FOREIGN ORIGIN		69	17	15	20	18	21	20	13	8	14	7	12	14	3		251	
JAPAN		64	16	15	18	14	17	17	7	5	10	5	5	10	3		206	
WEST GERMANY		2	1			3				1			3	1			11	
FRANCE					1		2	1	1	1	2			1			8	
ITALY		1						1	1	2		1	1	1			8	
UNITED KINGDOM		1					1	1	1		1						5	
U.S.S.R.							2	2	3	2	2	1	5	6			23	
SWEDEN				1			1										3	
NETHERLANDS									1		1						2	
ISRAEL													1				1	
ARGENTINA																	1	
CANADA		1				1											1	
U.S. ORIGIN OWNED		23	1	1	2	2	6	4	2	4	3	4	3	3	1		59	
U.S. CORP. OWNED		23	1	1	2	2	5	4	2	3	3	4	3	3	1		57	
U.S. GOVT. OWNED																	1	
U.S. INDIV. OWNED										1							1	
FOREIGN OWNED							1										1	
FOREIGN ORIGIN		69	17	15	20	18	21	20	13	8	14	7	12	14	3		251	
U.S. OWNED		2				1							2				5	
FOREIGN OWNED		67	17	15	20	17	21	20	13	8	14	5	12	14	3		246	
FOREIGN CORP.		61	17	14	20	15	21	19	12	8	14	4	10	13	3		231	
FOREIGN GOVT.		1															2	
FOREIGN INDIV.		5	1	1	2	2		1	1		1	2	1				13	

ABBOTT LABORATORIES

4309342 - ANTIBACTERIAL PEPTIDES

AGENCE NATIONALE DE VALORISATION DE LA RECHERCHE (ANVAR)

4366230 - PREPARATION PROCESS OF OPTICALLY ACTIVE +60 -AMINATED ACIDS BY BIOLOGICAL HYDROLYSIS OF NITRILES

AJINOMOTO COMPANY INCORPORATED

4334020 - METHOD OF PRODUCING L-GLUTAMIC ACID BY FERMENTATION

4346169 - METHOD FOR PRODUCTION OF L-ARGININE BY FERMENTATION

4346170 - METHOD FOR PRODUCING L-LYSINE BY FERMENTATION

4347317 - METHOD FOR PRODUCING L-GLUTAMIC ACID BY FERMENTATION

4347318 - METHOD FOR PRODUCING L-THREONINE BY FERMENTATION

ASAHI KASEI KOGYO KABUSHIKI KAISHA

4345627 - PROCESS FOR PRODUCING L-TRYPTOPHAN OR DERIVATIVES THEREOF USING A MICROORGANISM

4360594 - PROCESS FOR PRODUCING L-TRYPTOPHAN OR DERIVATIVES THEREOF USING MICROORGANISMS

CORNELL RESEARCH FOUNDATION INC.

4335210 - METHOD OF PRODUCING L-CYSTEINE

ELI LILLY AND COMPANY

4366147 - ANTIBIOTIC A-7413 AND PROCESS FOR PREPARATION THEREOF

E. N. I. ENTE NAZIONALE IDROCARBURI

4332905 - PROCESS FOR PREPARING CARBAMYL DERIVATIVES OF +60 -HYDROXY ACIDS AND THE CORRESPONDING +60 -HYDROXY ACIDS

ITSUBISHI PETROCHEMICAL CO., LTD.

4326029 - PROCESS FOR PRODUCTION OF L-ASPARTIC ACID

ITSUI TOATSU CHEMICALS INC.

4335209 - PROCESS FOR PREPARATION OF L-TRYPTOPHAN BY ENZYME

SHOWA DENKO KABUSHIKI KAISHA

4364875 - PROCESS FOR PRODUCING L-TRYPTOPHAN, AND A PURE CULTURE OF A MICROORGANISM STRAIN USED IN SAID PROCESS

SNAM PROGETTI S.P.A.

4312948 - ENZYMIC MICROBIOLOGICAL PROCESS FOR PRODUCING OPTICALLY ACTIVE AMINOCIDS STARTING FROM HYDANTOINS AND/OR RACE

MIC CARBAMOYL DERIVATIVES

W. R. GRACE & CO.

4329427 - FERMENTATIVE PREPARATION OF L-ISOLEUCINE

BIOTECHNOLOGY 1982 UPDATE - AMINO ACIDS

INVENTORS OF INDIVIDUALLY OWNED PATENTS

(ALPHA LISTING)

INVENTOR NAME

STREET

CITY

ST ZIP/CNTRY

DEBAYOV
4321325 - PROCESS FOR PRODUCING L-THREONINE

VLADIMIR G.

ULITSA MIKLUKHO-MAKAYA, 43, K

MOSCOW

SU

APPENDIX A

EXPLANATORY NOTES

Patent Front Pages

This brief explanation of the information available from a U.S. Patent is designed for the person unfamiliar with patents.

United States Patent [19]		[11] 4,275,161
Misaki et al.		[45] Jun. 23, 1981
[54] PROCESS FOR THE MANUFACTURE OF L-α-GLYCEROPHOSPHATE OXIDASE [75] Inventors: Hideo Misaki; Yoshifumi Horiuchi; Kazuo Matsura; Saburo Harada, all of Shizuoka, Japan [73] Assignee: Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan [21] Appl. No.: 59,583 [22] Filed: Jul. 20, 1979 [30] Foreign Application Priority Data Jul. 20, 1978 [JP] Japan 53-88637 [51] Int. Cl. C12N 9/04 [52] U.S. Cl. 435/190; 435/822 [58] Field of Search 435/190, 822	[56] References Cited U.S. PATENT DOCUMENTS 4,166,005 8/1979 Masurekar et al. 435/190 <i>Primary Examiner</i>—Lionel M. Shapiro <i>Attorney, Agent, or Firm</i>—Young & Thompson [57] ABSTRACT L-α-glycerophosphate oxidase can be produced by culturing <i>Aerococcus viridans</i> IFO-12219 or <i>Aerococcus viridans</i> IFO-12317. It is useful for analysis for L-α-glycerophosphate, because it catalyzes the reaction of L-α-glycerophosphate and oxygen to form dihydroxyacetone phosphate and hydrogen peroxide. 1 Claim, 4 Drawing Figures	

- A. 4,275,161 is the U.S. Patent number.
- B. June 23, 1981 is the issue date.
- C. Misaki is the last name of the inventor who is listed first.
- C. et al indicates that there are other inventors.
- D. Process for the Manufacture of L- α -Glycerophosphate Oxidase is the title describing the claimed invention.
- D. The patent shows the name and city of residence of each of the Inventors. Unassigned patents show the full address of the Inventors.
- D. Assignee refers to a company, organization or individual to which the inventors' rights to a patent are assigned. The name and city are shown.
- D. 59,583 is the number given to the application, which was filed on July 20, 1979.

- E. **Foreign Application Priority Data** indicates corresponding applications which were filed in other countries, gives the filing date and foreign application number. By fulfilling certain requirements, an applicant filing in the U.S. may be entitled to the benefit of the filing date of a prior application in a foreign country.
- F. **Int. Cl...C12N 9/04** is the International Patent Classification.
- F. **U.S. Cl...435/190, 435/822** are the two U.S. Classifications listed for this patent: Class 435, subclass 190 and Class 435, subclass 822. The classification listed in boldface on the patent is called the original classification (OR). The other is the cross-reference classification (XR). Every patent has one and only one original classification. If the disclosure of the patent falls into more than one subclass, additional copies of the patent are placed in those subclasses as cross-reference classifications.
- F. The **Field of Search...** refers to the U.S. Classification where the Patent Examiner searched to compare the claimed subject matter to that disclosed in previous patents and articles.
- G. **References Cited** refers to references which may be cited by the examiner and applicant to show the state-of-the-art or to indicate the prior art most closely related to the invention which is claimed in the application.
- H. The Patent and Trademark Office (PTO) requires that the patent application include a brief **Abstract** of the technical disclosure in the specification. The purpose of the abstract is to enable the PTO and the public to determine quickly the nature and gist of the technical disclosure.
- H. The front page also lists the number of **Claims** and the number of **Drawing Figures** in the patent. When appropriate, a representative drawing is also included on the front page of the patent.

Country Codes

The following country codes appear in Part 2D of the profiles.

AU - Australia	IL - Israel
CA - Canada	IR - Iran
CH - Switzerland	IT - Italy
DE - West Germany	JA - Japan
DK - Denmark	JP - Japan
DT - West Germany	SE - Sweden
EN - United Kingdom (England)	SF - Finland
ES - Spain	SU - Soviet Union
FI - Finland	SW - Sweden
FR - France	ZA - South Africa

Application Filing Date

The application filing date information as set forth in Parts 1 and 2A of the profiles is determined by taking all patents which issued between 1967 and 1981 and distributing them according to the year the application was filed in the PTO. Patents which were granted prior to 1967 are not included since the application date information for these patents is not in the data base. Also, applications which were filed but never issued (roughly 30% of the total filings), as well as those applications which were still pending as of December 31, 1981, are not included. Thus, only those applications which were filed and subsequently became patents with patent grant dates between 1967 and 1981 are included.

While the length of time between the patent application date and the patent grant date varies from patent to patent, the current average pendency is approximately 24 months. Clearly many applications filed in 1981 were still pending at the end of 1981, as were a number of those filed in 1980. Thus, application filing date data for these years are incomplete. While a small number of applications which were filed prior to 1980 were still pending, OTAF feels that the application date data prior to January 1980 are essentially complete. That is, the number shown for applications filed in the years prior to 1980 will not differ substantially with the passage of time, and this number is a true reflection of the number of applications filed in that year which have, and will, become patents. However, for the subsequent years, 1980 and 1981, that number will increase as more applications filed in those years become patents.

It should be remembered that the numbers reflect only those applications which became patents between 1967 and 1981. Thus, the column "pre-68" does not include all applications filed before 1968 but only those which issued in 1967 and subsequently. The graph of this information in Part 1 of each profile is limited to the years 1970-1979, years for which the application date data are essentially complete. Thus, the graphs are accurate representations of activity based on the application dates of subsequently issued patents.

Assignee

The term "assignee" refers to a company, organization or individual to which the inventor's rights to a patent are assigned. For the purpose of this publication, the assignee will, in all cases, refer to the assignee at the time the patent was granted. Approximately 80% of all U.S. patents are assigned when granted. By far, the largest portion of assignees are corporations.

Composite Total

Part 2C of each profile contains an alphabetical listing of assignees. In some instances, assignees are listed in more than one place due to variations in the printing of the name. These variations occur for a number of reasons, such as typographical errors, changes in company names, or differences in spacing or abbreviations. These variations also occur on the first pages of the patents which are shown in Part 3.

In Part 2B of each profile, which ranks assignees according to number of patents held, the number of patents listed for certain assignees may be a composite resulting from the combination of different titles which in fact signify identical assignees. An asterisk appears next to these totals. This will alert the reader that the particular assignee is listed under more than one title in Part C. The assignees making up composite groupings are listed below:

For: Purdue Research Foundation
See Also: Purdue Research Corporation

For: Hayashibara Biochemical Laboratories Incorporated
See Also: Kabushiki-Kaisha Hayashibara Seibutsu Kagaku Kenkyujo,
Kabushiki Kaisha Hayashibara Selbutsukagaku Kenkyujo, and
Hoyashibara Biochemical Laboratories Incorporated

For: Amano Pharmaceutical Co., Ltd.
See Also: Amano Seiyaku Kabushiki Kaisha

For: University of California, the Regents of
See Also: Regents of University of California

For: Stanford University, Leland Junior, The Board of Trustees of
See Also: Board of Trustees of the Leland Stanford University

For: Agence Nationale De La Valorisation de la Recherche (ANVAR)
See Also: Etablissement Public Det" Agence Nationale de Valorisation D

For: Novo Terapeutisk Laboratorium A/S
See Also: Nono Terapeutisk Laboratorium A/S

For: Meiji Seika Kaisha, Ltd
See Also: Miejr Seika Kaisha, Ltd

For: Institut Armand Frappier
See Also: L'Institut Armand-Frappier

For: University of California, The Regents of
See Also: Regents of University of California

* * *

APPENDIX B

PUBLICATIONS BY THE OFFICE OF TECHNOLOGY ASSESSMENT AND FORECAST

Copies of the publications listed below are available from:

National Technical Information Service (NTIS)
5285 Port Royal Rd.
Springfield, Virginia 22161
(703) 487-4650

When ordering from NTIS, please give the publication title and its "COM" or "PB" number. Most reports are also available on microfiche at a cost of \$4.50 per report - domestic, \$9.00 per report - foreign. Please note that prices are subject to change without notice.

• DESIGN PATENTS, 1983*

PB 83-224063; Cost: Domestic - \$15.50; Foreign - \$31.00

Compiles all available statistics on design patents granted in the U.S. Analyzes trends, and identifies the origins and ownership of U.S. design patents. Profiles major divisions within the design patent file, and identifies most active design areas. Includes selected patent front pages from each class in the Design Classification System.

• Industrial Robots: A Survey of Foreign and Domestic U.S. Patents, August 1982

PB 82-169269; Cost: Domestic - \$95.00; Foreign - \$190.00

Analyzes 212 U.S. patents disclosing industrial robot technology, including control & positioning, programming and motion systems, sensors, and grippers. Includes patent front pages and the first pages of the specification, arranged by technology. Discusses countries and companies most active in U.S. patenting of robotics. Includes microfiche containing the full text of 212 robot patents.

• Industrial Patent Activity in the United States, Parts 1 and 2, April 1983

PB 83-213413; Cost: Domestic - \$40.50; Foreign - \$81.00

This two-part publication gives information about the activity, ownership and national origin of patents granted by the U.S. Patent and Trademark Office. It identifies those U.S. and foreign organizations, e.g., corporations, government agencies and universities, which have been most active in the U.S. Patent System during the years 1969-1982. Yearly updates of this publication are expected. Each part, described on the next page, may be purchased separately.

*Also available from GPO. See page 287.

- Industrial Patent Activity in the United States, Part 1 - Time Series Profile by Company and Country of Origin, 1969-1982, April 1983
PB 83-169094; Cost: Domestic - \$25.50; Foreign - \$51.00

Part 1 shows the relative levels of patenting by all nations active in the U.S. Patent System and gives yearly counts of patents attributed to corporate, government and unaffiliated, e.g., "independent" inventors. It identifies companies having 10 or more patents in the 1969-1982 period, and ranks them in terms of total 14-year patent receipts. Patent activity for each year is profiled by both patent grant date and patented application filing date.

- Industrial Patent Activity in the United States Part 2 - Alphabetical Listing by Company, 1969-1982, April 1983
PB 83-169102; Cost: Domestic - \$19.50; Foreign - \$39.00

Part 2 is an alphabetical list of more than 20,000 U.S. and foreign organizations receiving at least three patents during the period 1969-1982. Included for each organization is the total patent count for the 14-year period.

PATENT PROFILES

These publications survey the U.S. patent activity in specific areas of selected, high-interest technologies. Each profile:

- identifies the technology area examined
 - illustrates its U.S. patent activity in graphic and tabular form
 - lists the owners of patents granted in the technology from January 1969, giving the patent numbers and titles
 - ranks owners holding the most patents in the area
 - identifies independent inventors of patents granted from January 1975, giving patent numbers, titles and addresses
- PATENT PROFILES - Biotechnology: 1982 Update, September 1983*
PB 83-240937; Cost: Domestic - \$15.50; Foreign - \$31.00

Profiles the patent activity in six areas of biotechnology involving enzymes and microorganisms, their use in the synthesis of certain products, and their preparation or modification. Includes an analysis of legal decisions which have affected the patenting of biotechnology processes and products. Lists recent foreign patent documents which disclose genetic engineering. Includes front pages of recent patents and selected patents of interest. This publication includes a section which updates through 1982 the six biotechnology areas profiled in PATENT PROFILES -Biotechnology (PB-82-250820).

*Also available from GPO. See page 287.

- PATENT PROFILES - Microelectronics - II, January 1983*
PB 83-1326613; Cost: Domestic - \$15.50; Foreign - \$21.50

The second in the series of profiles on microelectronics, this publication covers two additional areas of the technology -- Digital Logic Circuits and Semiconductor Memories. A third section -- Speech Analysis and Synthesis -- examines an area dealing with a practical application of microelectronics technology. Includes front pages of 30 patents and briefly describes their particular significance in the art. Provides an analysis of organizational patenting patterns.

- PATENT PROFILES - Microelectronics-I, February 1981*
PB 81-179582, Cost: Domestic - \$8.50 Foreign - \$17.00

Profiles the patenting activity in two representative segments of microelectronics technology relating to integrated circuit structure and information processing devices, e.g., "CPU's." For patents issuing from 1/1980 to 10/1980, includes front pages, showing bibliographic information, an abstract of the disclosure, and an appropriate drawing. Includes information about references cited during the examination period.

- PATENT PROFILES-Solar Energy, January 1980*
PB 80-190010, Cost: Domestic - \$6.50 Foreign - \$13.00

Profiles the patenting activity in five areas of technology using energy provided by the sun and in three areas using energy derived from other natural sources, such as wind, tide, wave, and geothermal. A cumulative profile of the five solar areas illustrates the dramatic growth in this field.

- PATENT PROFILES-Synthetic Fuels, December 1979*
PB 80-128572, Cost: Domestic - \$6.50 Foreign - \$13.00

Profiles the patent activity in ten areas of synthetic fuel technology dealing with the conversion of solid carbonaceous material to liquid or gaseous hydrocarbons. Starting materials include coal, oil shale, bituminous sands, wood and organic wastes.

TECHNOLOGY ASSESSMENT AND FORECAST REPORTS

- Tenth Report, November 1981*
PB 82-215658; Cost: Domestic - \$16.50; Foreign - \$33.00

Updates the "Top 50" introduced in the Ninth Report. Reviews the U.S. patent activity of some of the largest European and Japanese foreign multinational corporations, over time, across technology and relative to one another. Provides an extensive review of the changing standards for computer software patentability, including the 1981 Supreme Court decision, and examines the impacts of such changes on a representative technology -- seismic data processing. Demonstrates, using aerospace technology patenting as an example, how the patent file can be used as a source for historical, technical or bibliographic data.

*Also available from GPO. See page 287.

- Ninth Report, March 1979*

PB 293380; Cost: Domestic - \$16.50; Foreign - \$33.00

Presents "Top 50" most active technologies in three categories -- Most Active, Fastest Growing, and Most Foreign-Active -- for each of three broad groupings of technology -- Chemical, Electrical and Mechanical. Examines trends in domestic patenting and independent inventor patenting. Includes an extensive review of patenting in "Ferrous Metal" technologies. Concludes with a discussion of two experiments in the transfer of "appropriate technology" to small businesses and developing countries.

- Eighth Report, December 1977*

PB 276375; Cost: Domestic - \$13.50; Foreign - \$27.00

Reviews U.S. patenting in the context of domestic vs. international patenting and analyzes the balance of patenting between the U.S. and other countries. Presents a study demonstrating the use of patents and the patent file as a unique technological resource. Concludes with an in-depth analysis of patent activity in geophysical exploration for hydrocarbons.

- Seventh Report, March 1977*

PB 265792; Cost: Domestic - \$18.00; Foreign - \$36.00

Reviews historical patenting and trademark registration trends, and includes the most extensive collection of historical U.S. patent data ever presented in a single publication. Uses data relating to patents granted by foreign nations for a study of invention sources. Uses pending patent application data for forecasting. Presents brief reviews of 16 technologies experiencing high overall or foreign patent activity. Concludes with the series' most comprehensive assessment of activity in a given technology, specifically in computer memories.

- Sixth Report, June 1976

PB 254188; Cost: Domestic - \$16.50; Foreign - \$33.00

Reviews 15 technologies with unusually high foreign activity and 22 technologies with high overall activity. Updates the 1973 reports on patent activity in solar energy, and adds reports on the use of waste material or wind for energy generation. Presents comparisons of patenting to R&D expenditures and R&D manpower allocations in six selected industries. The report concludes with a review of six most often cited patents in 1975, five U.S. and one foreign patent.

- Fifth Report, August 1975

COM 75-11142; Cost: Domestic - \$15.00; Foreign - \$30.00

Reviews 60 technological areas, not previously reported on, which experience a high level of overall activity or of foreign activity. Presents patent activity data in categories corresponding to 36 Product Fields of the Standard Industrial Classification System.

*Also available from GPO. See page 287.

- Fourth Report: A Review of Patent Ownership, January 1975
COM 75-10050; Cost: Domestic - \$13.50; Foreign - \$27.00

Identifies the 73 corporations and government agencies which received 500 or more patents during the five year period 1969-1973, and reviews and compares their patent activity across the spectrum of technology. Also reviews in terms of patent ownership, the patent activity during the same period, in nuclear energy technology and oil shale and coal gasification technology.

- Third Report, June 1974
COM 74-11383; Cost: Domestic - \$16.50; Foreign - \$33.00

Presents an overview of the technological activity, across all technologies, of a group of selected foreign countries and a group of selected U.S. states. Extends energy area treatments to include oil shale and coal gasification technologies. Reviews additional technological areas having a high level of overall activity.

- Early Warning Report, December 1973
COM 74-10150; Cost: Domestic - \$22.50; Foreign - \$45.00

Spotlights those technological areas experiencing a high level of overall activity or of foreign activity. Reviews patent activity in a number of energy areas, including nuclear, solar, geothermal, and tide, wind and wave energy.

- Initial Publication, May 1973
COM 73-10767; Cost: Domestic - \$12.00; Foreign - \$24.00

Describes OTAF program and gives sample reports on 24 wide ranging areas of technology in varying levels of detail.

*NOTE: The following publications may also be obtained from:

The Superintendent of Documents
U.S. Government Printing Office
Washington, DC 20402

Their identification numbers and costs are:

- Seventh Report, 003-004-00542-4; Cost: \$4.25
- Eighth Report, 003-004-00550-5; Cost: \$3.75
- Ninth Report, 003-004-00559-9; Cost: \$4.00
- Tenth Report, 003-004-00580-7; Cost: \$7.00
- PATENT PROFILES-Synthetic Fuels, 003-004-00566-1; Cost: \$5.50
- PATENT PROFILES-Solar Energy, 003-004-00568-8; Cost: \$5.50
- PATENT PROFILES-Microelectronics - I, 003-004-00574-2; Cost: \$7.00
- PATENT PROFILES-Biotechnology: 1982 Update, (Order number and cost not available at time of printing)
- PATENT PROFILES-Microelectronics - II, 003-004-00595-5; Cost: \$6.50
- DESIGN PATENTS, (Order number and cost not available at time of printing)

APPENDIX C

CUSTOM PATENT REPORTS FROM THE OFFICE OF TECHNOLOGY ASSESSMENT AND FORECAST

OTAF's computerized base of data relating to the U.S. patent file includes, at present:

- all subclasses of the U.S. Patent Classification (USPC) System, and the classification within this System of all U.S. patents, including utility and design patents
- the relationship of all utility subclasses in the U.S. Patent Classification System to 55 Product Fields and combinations of Product Fields in the Standard Industrial Classification (SIC) System
- the category of ownership at time of issue, e.g., U.S. government, foreign government, U.S. corporation, foreign corporation, U.S. individual, foreign individual (for utility patents issued since 1963 and for design patents issued since 1977)
- the country or state of residence of the inventor (for utility patents issued since 1963 and for design patents issued since 1977)
- the date the application for patent was filed in the U.S. (for utility patents issued since 1967 and for design patents issued since 1977)
- the specific (i.e., named) ownership of all patents which, at time of issue, were owned by an organization (for utility patents issued since 1969 and for design patents issued since 1977)
- the patent title (for utility patents issued since 1969 and for design patents issued since 1977)
- the name and address of inventors of unassigned patents (for utility patents issued since 1975 and for design patents issued since 1977)
- the field of search and references cited in the examination leading to the patent grant (for utility patents issued since 1975 and for design patents issued since 1977)

Custom Patent Reports

Data can be retrieved on the basis of any one or any combination of the factors listed above, manipulated on most any given basis and presented in a number of formats, e.g., lists, tables, graphs, charts, etc. This flexibility is illustrated in OTAF publications, such as Technology Assessment and Forecast Reports and PATENT PROFILES, and by the following excerpts from custom reports. Samples of standard format custom reports are available from OTAF.

Technology Profile Report

This standard format multi-part report uses most of the elements in OTAF's data base to provide a detailed patent profile of a specific technology or subject area. Information provided includes rate of patenting, origin of patenting, type of assignment, specific assignment, patent numbers and their titles, and names and addresses of "independent" inventors. There are four parts (parts A, B, C, & D) which comprise a complete report. Part A includes patenting activity percentages, and time-series distribution by general assignment category and origin of patents, Part B is a ranked listing of organizations which shows counts of patents granted by both year of application filing and grant date, Part C lists organizations alphabetically with patent numbers and titles, Part D gives the name and address of the inventors of patents assigned to individuals or unassigned at time of issue, and includes patent numbers and titles. This report can be tailored to specific needs. This PATENT PROFILES publication is itself an example of the data presented in a Technology Profile Report.

Organizational Profile Report

Pages 292-293 show excerpts from another of OTAF's standard format custom reports, the Organizational Profile. This report profiles patent activity across all of the classes and subclasses of the USPC System, and gives specific patent numbers and titles. The reports may be limited to specific classifications. Pages from a report on Atlantic Research Corporation are given as an example. This type of report can be prepared on the patents of any organization or grouping of organizations, or on the patents granted to the residents of any state or country or grouping of states or countries.

Multi-Corporate Patent Activity Profile

Like the above described Organizational Profile, this report also profiles patent activity across the classes and subclasses of the USPC System. Multi-Corporate Profiles may be limited to specific classifications. In this report, the activity of up to eight organizations is provided simultaneously, facilitating comparisons between organizations. Unlike the Organizational Profile, no patent numbers or patent titles are given. A sample page from a report on AT&T, Bell Labs, Teletype and Western Electric is shown on page 294.

Enterprise Patenting Report

Page 295 shows an excerpt from a standard format Enterprise Patenting Report on AT&T. Here, the number of patents per year per class is given for a parent company and its patenting subsidiaries. An optional part of this report lists all of the organizations considered under the enterprise name and indicates the total number of patents held by each of them.

SIC Product Field Reports

On page 296 is a listing of Standard Industrial Classification (SIC) Product Fields for which a concordance exists with utility subclasses of the USPC System. Custom patent reports, such as the Technology Profile Report, can be prepared for any of these Product Fields.

Other Standard Format Reports

OTAF has developed the flexibility to prepare other standard format reports designed to meet the needs of a large number of users. These include:

- Corporate Patenting Report where patents of the designated organization are given in numerical order,
- Search and Citation Report which includes, for a designated classification or group of classifications, the number and origin of the references cited during the examination period leading to the grant of the patent, the U.S. references most frequently cited and the owner (assignee) of patents most frequently cited, and
- Mailing Labels for inventors of unassigned patents.

How to Obtain OTAF Custom Reports

Contact OTAF to discuss the type of information you need. OTAF will assist you in determining the report content and format that best suits your needs, and provide you with a free estimate of its cost. If the terms are acceptable to you, the report will be prepared and forwarded to you, usually within seven working days.

Costs

All Custom Reports are provided on a cost reimbursable basis and billed through the National Technical Information Service to which payment is made by check, or charged to an NTIS deposit account or major credit card. These costs may vary widely -- from as low as \$75.00 for some forms of our standard format reports, to several thousand dollars for complex or large scale treatments. The preparation of specially tailored reports, requiring extensive professional time, programming and/or computer time, is subject to the availability of OTAF resources. Cost estimates for specifically requested custom reports will be provided prior to report preparation.

Whom to Contact

Inquiries concerning OTAF publications/services are invited and should be directed to:

Office of Technology Assessment and Forecast
U.S. Patent and Trademark Office
Washington, D.C. 20231
Phone: (703) 557-2982

-SAMPLE-

ORGANIZATIONAL PROFILE

EXPLANATION OF DATA

This report profiles patents falling into a particular "category" by the U.S. patent classifications into which those patents have been placed. The "category" may be a specific ownership (e.g., a specific corporation or government agency, etc.) or a country or state of inventor residence. The report may show patents in original classifications only (OR) or in original plus any appropriate cross-reference classifications (OR + XR).

Each major patent classification (class) is identified by its title. Then, for each of the subclasses within that class where patents from the "category" have been placed, the following are given:

- TOTAL (number of "category" patents in subclass)
- OR (number of TOTAL which are original classifications)
- XR* (number of TOTAL which are cross-reference classifications)
- PCT OF TOTAL OR (number of OR's in subclass divided by number of OR's in "category" x 100)
- PCT OF ALL (OR + XR*) (number of OR's + number of XR's* in subclass divided by number of OR's + XR's* in "category" x 100)
- * Number will be zero if report is limited to OR's.

The above figures are then given for the entire class. Also given are the patent numbers of the "category" patents in each subclass. The type of classification (OR or XR) assigned to each patent is shown in parentheses following the patent number.

For patents issuing in 1969 and subsequently, the patent titles are given. (Note: any symbols in a patent title which are not available on the computer printer are spelled out, e.g., β is shown as BETA. Superscripts and subscripts are indicated by encloser between upwardly or downwardly facing slashes, e.g., H₂O is shown as H/2\O and Y₂X is shown as Y\2/X.)

The patents included in the report are those which according to the data of record in the OTAF computer data base, fall within the category covered in the report. These category data are recorded at the time of patent issue and are essentially accurate. However, any patent listing should not be considered to be inclusive of all relevant patents, nor exclusive of all non-relevant patents.

-SAMPLE-

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ORGANIZATIONAL PROFILE - ATLANTIC RESEARCH CORPORATION

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CLASS 423 - CHEMISTRY, INORGANIC										
TOTAL CLASS 423	TOTAL	3	(OR)	1	(XR)	2	PCT OF TOTAL OR	2.8	PCT OF ALL (OR+XR)	1.7
CLASS 424 - DRUG, BIO-AFFECTING AND BODY TREATING COMPOSITIONS										
SUBCLASS 366	TOTAL	1	(OR)	1	(XR)	0	PCT OF TOTAL OR	2.8	PCT OF ALL (OR+XR)	.6
3840667 (OR) - OXYGEN-CONTAINING ATMOSPHERES										
TOTAL CLASS 424	TOTAL	1	(OR)	1	(XR)	0	PCT OF TOTAL OR	2.8	PCT OF ALL (OR+XR)	.6
CLASS 427 - COATING PROCESSES										
SUBCLASS 122	TOTAL	1	(OR)	0	(XR)	1	PCT OF TOTAL OR	0.0	PCT OF ALL (OR+XR)	.6
4029844 (XR) - ROCKET NOZZLE COMPRISING PYROLYTIC GRAPHITE-SILICON CARBIDE INSERTS										
SUBCLASS 219	TOTAL	1	(OR)	0	(XR)	1	PCT OF TOTAL OR	0.0	PCT OF ALL (OR+XR)	.6
4029844 (XR) - ROCKET NOZZLE COMPRISING PYROLYTIC GRAPHITE-SILICON CARBIDE INSERTS										
SUBCLASS 223	TOTAL	1	(OR)	0	(XR)	1	PCT OF TOTAL OR	0.0	PCT OF ALL (OR+XR)	.6
3738906 (XR) - PYROLYTIC GRAPHITE-SILICON CARBIDE MICROCOMPOSITES										
SUBCLASS 228	TOTAL	3	(OR)	1	(XR)	2	PCT OF TOTAL OR	2.8	PCT OF ALL (OR+XR)	1.7
3924034 (OR) - PROCESS OF MAKING PYROLYTIC GRAPHITE-SILICON CARBIDE MICROCOMPOSITES										
3925133 (XR) - METHOD FOR MAKING REINFORCED PYROLYTIC GRAPHITE-SILICON CARBIDE MICROCOMPOSITES										
4029844 (XR) - ROCKET NOZZLE COMPRISING PYROLYTIC GRAPHITE-SILICON CARBIDE INSERTS										
SUBCLASS 249	TOTAL	4	(OR)	0	(XR)	4	PCT OF TOTAL OR	0.0	PCT OF ALL (OR+XR)	2.3
3738906 (XR) - PYROLYTIC GRAPHITE-SILICON CARBIDE MICROCOMPOSITES										
3877080 (XR) - ACICULAR SILICON CARBIDE DISPERSION IN PYROLYTIC GRAPHITE MATRIX FOR USE IN BIOMEDICAL IMPLANTS										
3924034 (XR) - PROCESS OF MAKING PYROLYTIC GRAPHITE-SILICON CARBIDE MICROCOMPOSITES										
4029844 (XR) - ROCKET NOZZLE COMPRISING PYROLYTIC GRAPHITE-SILICON CARBIDE INSERTS										
SUBCLASS 399	TOTAL	1	(OR)	0	(XR)	1	PCT OF TOTAL OR	0.0	PCT OF ALL (OR+XR)	.6
3924034 (XR) - PROCESS OF MAKING PYROLYTIC GRAPHITE-SILICON CARBIDE MICROCOMPOSITES										
TOTAL CLASS 427	TOTAL	11	(OR)	1	(XR)	10	PCT OF TOTAL OR	2.8	PCT OF ALL (OR+XR)	6.4
CLASS 428 - STOCK MATERIAL OR MISCELLANEOUS ARTICLES										
SUBCLASS 37	TOTAL	1	(OR)	1	(XR)	0	PCT OF TOTAL OR	2.8	PCT OF ALL (OR+XR)	.6
3853586 (OR) - TAPERED CARBON/PYROLYTIC GRAPHITE COMPOSITE MATERIAL										

-SAMPLE-

OTAF CUSTOM REPORT
MULTI-CORPORATE PATENT ACTIVITY PROFILE - (1969 - 1982)

CLASS 179 - TELEPHONY								
AT+T	BELL LABS	TELETYPE	WESTERN ELEC					
TOTAL	TOTAL	TOTAL	TOTAL	TOTAL				
PCT	PCT	PCT	PCT	PCT				
				</				

-SAMPLE-

ENTERPRISE PATENTING - AMERICAN TELEPHONE+TELEGRAPH INC.

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PATENTS GRANTED - BY CLASS BY YEAR

CLASS	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	TOTAL
320	0	0	1	0	1	0	0	0	1	0	0	0	0	0	3
323	3	3	0	7	3	0	1	4	1	3	1	0	0	5	42
324	33	34	21	17	13	9	8	11	13	5	7	11	10	5	197
328	9	19	11	7	9	8	6	4	5	1	0	3	1	2	88
329	3	2	1	3	1	3	0	4	1	0	0	0	1	0	19
330	23	20	17	19	11	12	14	7	3	6	4	6	3	3	148
331	13	330	26	18	7	6	5	3	8	1	1	1	5	1	102
332	18	9	10	12	6	5	5	1	3	1	1	3	1	0	72
333	27	39	53	24	38	11	12	11	4	7	8	1	3	11	255
335	7	2	5	7	5	4	1	5	3	1	1	3	2	1	47
336	5	0	1	0	0	0	0	0	0	0	0	0	0	0	10
337	1	0	1	0	3	0	1	0	3	1	0	0	0	0	10
338	1	1	2	1	0	0	0	1	0	0	0	0	2	1	10
339	6	6	12	7	6	8	4	9	9	15	6	16	20	16	140
340	15	23	22	25	13	12	12	12	15	14	7	6	7	8	191
343	4	10	8	7	2	0	5	2	3	4	4	6	6	6	67
346	36	34	3	5	3	1	3	6	2	0	0	1	0	0	27
350	350	29	40	37	20	18	18	9	18	28	20	21	18	8	336
351	1	1	0	0	0	0	0	0	0	0	0	0	0	1	5
353	0	0	0	3	1	0	0	0	0	0	0	0	1	0	6
354	0	0	0	2	0	0	0	0	0	0	0	0	0	0	1
355	0	0	4	2	0	2	2	0	1	0	0	3	0	0	14
356	0	6	3	8	7	6	4	5	7	3	2	4	6	5	66
357	5	5	13	10	7	14	13	14	7	12	13	17	15	11	156
358	5	23	17	20	17	12	7	17	9	10	2	9	8	0	156
360	2	5	1	4	1	1	2	4	4	0	2	0	2	0	28
361	15	3	11	13	1	7	5	2	4	0	6	7	12	6	95
362	7	3	0	5	2	0	0	0	6	3	2	0	4	2	62
363	16	20	58	30	28	6	17	16	13	13	9	15	16	17	282
365	62	42	35	50	31	25	5	7	16	6	11	16	9	13	328
366	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2
367	1	1	0	1	2	0	1	1	0	0	0	0	1	0	9
368	0	0	1	1	2	0	0	0	0	0	0	0	0	0	4
369	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
370	17	27	19	23	30	18	15	11	16	11	10	8	12	9	226
371	17	11	10	11	11	6	6	10	4	5	5	0	3	3	103
372	24	27	31	25	28	15	7	9	4	5	5	6	0	6	197
373	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
374	1	1	3	0	1	4	0	0	15	3	0	1	0	0	8
375	10	16	23	16	16	4	11	10	15	10	0	6	7	10	148
376	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
377	4	5	8	5	2	6	2	4	1	1	0	2	0	0	40
378	0	0	0	0	0	0	1	0	2	1	1	3	0	0	15
380	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
403	0	0	0	4	3	3	6	6	1	3	1	1	1	1	31
405	2	1	0	0	0	0	0	0	0	0	0	0	0	0	3
406	0	1	0	0	0	0	0	0	0	0	0	0	0	0	4
408	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
409	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1
411	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
414	2	3	5	1	2	0	1	0	1	3	0	1	1	1	21
417	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
418	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
419	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4

STANDARD INDUSTRIAL CLASSIFICATION PRODUCT FIELDS

<u>Product Field</u>	<u>SIC Code</u>
FOOD AND KINDRED PRODUCTS	20
TEXTILE MILL PRODUCTS	22
CHEMICALS AND ALLIED PRODUCTS	28
Chemicals, Except Drugs & Medicines	281, 282, 284-289
Basic Industrial Inorganic & Organic Chemistry	281, 286
Industrial Inorganic Chemistry	281
Industrial Organic Chemistry	286
Plastics Materials & Synthetic Resins	282
Agricultural Chemicals	287
All Other Chemicals	284, 285, 289
Soaps, Detergents, Cleaners, Perfumes, Cosmetics & Toiletries	284
Paints, Varnishes, Lacquers, Enamels, & Allied Products	285
Miscellaneous Chemical Products	289
Drugs and Medicines	283
PETROLEUM & NATURAL GAS EXTRACTION & REFINING	13, 29
RUBBER & MISCELLANEOUS PLASTICS PRODUCTS	30
STONE, CLAY, GLASS AND CONCRETE PRODUCTS	32
PRIMARY METALS	33, 3462, 3463
Primary Ferrous Products	331, 332, 3399, 3462
Primary & Secondary Non-Ferrous Metals	333-336, 339 (except 3399), 3463
FABRICATED METAL PRODUCTS	34 (except 3462, 3463, 348)
MACHINERY, EXCEPT ELECTRICAL	35
Engines & Turbines	351
Farm & Garden Machinery & Equipment	352
Construction, Mining & Material Handling Machinery & Equipment	353
Metal Working Machinery & Equipment	354
Office Computing & Accounting Machines	357
Other Machinery, Except Electrical	355, 356, 358, 359
Special Industry Machinery, Except Metal Working Machinery	355
General Industrial Machinery & Equipment	356
Refrigeration & Service Industry Machinery	358
Miscellaneous Machinery, Except Electrical	359
ELECTRICAL AND ELECTRONIC MACHINERY, EQUIPMENT AND SUPPLIES	36, 3825
Electrical Equipment, Except Communication Equipment	361-364, 369, 3825
Electrical Transmission & Distribution Equipment	361, 3825
Electrical Industrial Apparatus	362
Other Electrical Machinery, Equipment & Supplies	363, 364, 369
Household Appliances	363
Electrical Lighting & Wiring Equipment	364
Miscellaneous Electrical Machinery, Equipment & Supplies	369
Communication Equipment & Electronic Components	365-367
Radio & Television Receiving Equipment Except Communication Types	365
Electronic Components & Accessories & Communication Equipment	366-367
TRANSPORTATION EQUIPMENT	37, 348
Motor Vehicles & Other Transportation Equipment, Except Aircraft	348, 371, 373-376, 379
Motor Vehicles & Motor Vehicle Equipment	371
Guided Missiles & Space Vehicles & Parts	376
Other Transportation Equipment	373-375, 379 (except 3795)
Ship & Boat Building & Repairing	373
Railroad Equipment	374
Motorcycles, Bicycles & Parts	375
Miscellaneous Transportation Equipment	379 (except 3795)
Ordnance Except Missiles	348, 3795
Aircraft & Parts	372
PROFESSIONAL & SCIENTIFIC INSTRUMENTS	38 (except 3825)

APPENDIX D

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